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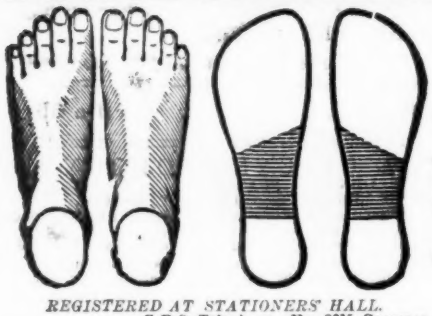

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Ardath Tobacco Co., Ltd.—
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TYPEWRITING, &c.:—
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An Inquiry
INTO
THE NATURAL HISTORY OF SEPTIC WOUNDS.

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(A Report in three Sections to the Medical Research Committee.)

(WITH ILLUSTRATIVE PLATE.)

SECTION I.—SINUSES AND SINUS FORMATION.

Scope of Inquiry.

AN attempt has been made to study the bacteriological flora of the wounds from the moment of admission to hospital, and subsequently through the various stages of the illness, correlating the bacteriological knowledge with the clinical symptoms, surgical treatment, and sequelæ. The condition of the blood was also studied in relation to the degree and variety of sepsis, and particular attention given to the benefit or otherwise of the use of bacterial vaccines. As the inquiry progressed certain other problems related to the persistence of unhealed wounds with sinus formation, and the appearance of general disturbance with secondary attacks of fever and inflammation, often associated with trivial surgical interference with the wound, demanded special attention. The inquiry is divided into three main lines of research, necessitating a division of the report into three sections, mutually interdependent—namely, (1) Sinuses and sinus formation; (2) Vaccine therapy and wound infection; (3) General tissue reactions in wound infection.

The following schedule indicates the scheme by which the data of the report were obtained.

1. *Bacterial flora and clinical symptoms of various degrees of injury* which have been classified as far as is possible to do so into four classes: (*a*) Simple flesh wounds. (*b*) Flesh wounds with considerable damage and bruising to the soft parts but without definite bone injury, as determined by radiographic examination. (*c*) Wounds with bone injury, compound comminuted fractures, &c. (*d*) Wounds involving joints with or without fracture of bone, abdominal wounds, skull and spinal wounds.

2. *A critical inquiry into the use of bacterial vaccines as an adjunct to other methods of treatment.*—The cases for this part of the investigation were selected in pairs conforming to the four classes noted above. One case was given vaccine treatment and the other retained as a control. As far as possible cases from the same convoys were selected, wounded on or about the same date and treated in the same ward under the same medical officer and general surgical procedure. When this was not possible great care was exercised to select cases with similar surgical conditions and subjected to the same treatment. The clinical history of the cases was carefully followed from the records kept in the wards, temperature charts, &c.

3. *Alteration in the blood in cases of wound infection* relating both to the corpuscular elements and the serum. Several points of diagnostic and prognostic importance have been studied and will be subsequently dealt with.

4. *The bacterial flora of sinuses and the bacterial factors* in so-called "flares" following secondary operations. Many of the cases originally examined in the base hospital are transferred to an auxiliary hospital and are readmitted to the base hospital for further surgical treatment or for medical boards. The presence of sinuses and sequestra in many of these cases called for special attention, and several important facts bearing on treatment have come to light, and as the observations have extended over a considerable time the cases are representative of the general types of wound infection.

Bacteriological Methods.

As the routine methods in use have been the same throughout the whole of my investigations a preliminary epitome of them will be given.

In every case films of the pus were examined microscopically stained by Gram's stain counterstained with dilute carbol-fuchsin. In some instances further films were examined with Giemsa's stain and Muir's capsule stain.

Cultural Methods.

The material (pus or other discharge) was collected before the wound was dressed by means of a sterile swab on a long stout wire, enabling the depth of the wound to be examined. In the case of closed cavities, sequestra, &c., a swab of the surgeon's wound was obtained before the cavity was entered and subsequently from the depth of the cavity, avoiding the external part of the wound. Portions of bone from sequestra, callus, pieces of muscle, and other tissue were also examined and a portion further submitted to histological examination. The material so obtained was inoculated on to the following media: (1) egg-broth; (2) glucose formate broth; (3) minced autoclaved meat; (4) autoclaved milk; (5) gelatin. The milk, egg-broth, and meat were heated and a layer of liquid paraffin poured on. For the sowings the original material was suspended in broth and inoculated (1) into the egg-broth without previous heating; (2) heated to 60° C. for 15 minutes and sown in milk; (3) heated to 80° C. for 5 minutes and sown in meat; (4) on to the gelatin and glucose formate broth without heating. If plenty of the original material is present in the broth emulsion before sowing, especially blood and bits of tissue, the paraffin method was found to be reliable, and has rarely failed to give a good growth of all the organisms seen in the pus films. The results compared very favourably with those obtained by the anaerobic jar method, and the process is economical with regard to space. Subcultures on to paraffin-covered media are not so satisfactory, and further subcultures and plates were treated in the anaerobe jar.

Preparations of the egg-broth and glucose formate broth, meat and milk at 24–48 hours were stained by Gram and counterstained with carbol-fuchsin; hanging-drop preparations were also examined when indicated. By these means an early general diagnosis is possible in 24–48 hours. The smear preparation can be used for provisional diagnosis. Thus a film showing Gram-positive bacilli with no spores and the organisms surrounded by a capsule is evidence of infection with B. perfringens. Spore-forming Gram-positive bacilli with clostridial and subterminal spore formation indicate bacilli of the malignant œdema group, or of B. Rodella III. (Hibler IX.).

The further diagnosis is completed by examination of the cultures and films, &c., of the 48 hours' growth thus:—

Egg-broth.—Cocci (streptococci, staphylococci), B. proteus, and B. malignant œdema produce a thick flocculent precipitate; when malignant œdema is present there may be black staining. B. perfringens alone produces no precipitation of egg-broth. Evil putrefactive smell is caused by the malignant œdema group and B. Hibler groups, not by B. perfringens, the latter only causing a butyric smell.

Milk.—B. perfringens produces a "stormy clot"—i.e., acid with evolution of gas which causes the clot to be broken up; it often adheres in torn fragments to the side of the tube and considerable contraction, at first suggesting peptonisation, occurs, but no subsequent digestion of the clot takes place. Streptococci and staphylococci produce acid and occasionally clotting; no digestion. B. malignant œdema does not affect the milk in 24 hours, and in the presence of rapidly growing perfringens not at all. Alone and in combination with B. perfringens digestion occurs slowly. Hibler IX. (Rodella III.) has a very slow peptonising effect.

Meat.—Streptococci and staphylococci have no marked action. B. perfringens group causes a red colouration, peptonisation and gas formation, and a smell of butyric acid, but no putrefactive odour. Malignant œdema and B. Hibler produce peptonisation, malignant œdema blackening; isolated black patches in a reddish-brown matrix are often seen, indicating B. perfringens and malignant œdema. Both malignant œdema and B. Hibler evolve putrid gases.

Glucose formate broth.—Aerobic organisms belonging to the coli and proteus group, staphylococci and streptococci may be observed; gas formation points to the presence of either the coli or the proteus groups; streptococci from the wound grow feebly on this medium. They are more often found on the egg-broth growing into long chains, and the class of streptococci met with appear in the main to be facultative anaerobes. B. perfringens may grow for a time when many

aerobic organisms are present; it occasionally grows in the glucose formate broth, but is easy to detect.

Gelatin.—Stab cultures on gelatin may show liquefaction in 24 hours. This is usually due to the presence of the proteus group.

For the purpose of diagnosis the following characters were relied upon:—

Anaerobic Bacilli Group.

(A) *B. malignant œdema.*—Gram-positive, in old cultures three days or more Gram-negative, motile, spore-forming obligatory anaerobic bacilli, spores oval and round. Spore formation very rapid, central and subterminal, but always with a small portion of the bacillus beyond the spore in the latter case. (Fig. 1.) Clostridial forms characteristic. Egg-broth thick precipitate often yellow; meat black deposit, meat peptonisation with disgusting putrefactive gas. Woolly colonies on plating out, with white opalescent change in egg-agar medium, serum and Dorset egg liquefied.

(B) *B. perfringens group.*—Large Gram-positive, often Gram-negative, non-motile bacilli; spore formation rarely seen except upon serum and egg medium without broth. Tendency to stain irregularly, on using Gram's black dots and bars, the latter may be parallel to the sides of the bacillus stain. "Stormy clot" and acid and gas on milk. No liquefaction of serum. (Fig. 2.) Glucose and lactose acid and gas. Colonies smooth; not woolly.

(C) *B. Hibler IX.* (*Rodella III.*).—Slightly motile or non-motile Gram-positive bacilli rapidly becoming Gram-negative. Oval terminal spores general eccentric to the long axis of the organism. The bacilli are often very long and may show double spore formation. (Figs. 3 and 4.) Ordinarily a number of organisms with partially developed spores are seen in cultures. (Fig. 4.) In these instances the area of spore formation stains a much deeper colour with Gram's stain than the remainder of the bacillus. Peptonisation of meat with fœtid smell, slow peptonisation of milk. Smooth colonies with slightly thickened crenated edge; not woolly.

(D) *B. necrosis.*—A long non-motile Gram-negative slender and often pointed-end bacillus, growing with considerable difficulty. No spores are formed. Meat undergoes peptonisation; no gas and no clot or acid formed in milk. Diffuse woolly colonies with long tangled thread formation.

Aerobic Group.

(A) *Coli group.*—Lactose-fermenting organisms. Gram-negative, non-sporing, motile; non-liquefying. The various members of this group are under examination, and will be recorded in a later communication.

(B) *Proteus group.*—Non-lactose-fermenting organisms, motile, Gram-negative, non-sporing; gelatin rapidly liquefied, facultative anaerobic. Milk digested without acid formation.

(C) *Cocci group: staphylococci, streptococci.*

B. pyocyaneus was isolated on many occasions, often appearing and disappearing in the wounds in a manner suggesting secondary or aerial infection, although no other cases with blue pus were present in the ward. There was no apparent co-relation between the clinical symptoms and the presence of this organism in any but a very limited number of cases. The routine examination of the aerobic group was conducted along the usual lines. MacConkey's lactose bile-salt agar was used for the isolation of any Gram-negative bacilli, a tabular grouping adopted similar to that suggested by MacConkey[1] for the lactose fermenters. The essential details will be given in a later section of this report.

For the further recognition of the anaerobic organisms subcultures from plates were examined. Egg-agar, glucose formate agar, and serum-agar were used at different times. Egg-agar was found to give as good results as serum-agar and was finally adopted. The plates were incubated in a large gas jar with tightly fitting metal lid with rubber washer and kept in position by screws similar to the arrangement used for autoclave lids. The lower part of the jar was occupied with an inverted bottle and broken glass tubes, and filled to an appropriate level with 10 per cent. pyrogallic acid in 20 per cent. caustic potash. The jar was then thoroughly exhausted with a water pump and hydrogen run in. By this means surface colonies of malignant œdema and B. Hibler were obtained without difficulty even when the surface of the plate was smeared. It was found on experiment that the dilution method gave a better separation of the anaerobes than the surface method, and in separating mixtures the dilution method was followed, surface smears being used only for studying the individual colonies of pure cultures. Various anaerobic cocci, especially an anaerobic streptococcus and an irregular coccus, probably diplococcus magnus of Tissier,[2] were observed often mixed with the malignant œdema colonies. (See Fig. 4.)

General Explanation of Tables I. and II.

In Tables I. and II. I have collected some of the more important facts relating to 77 cases of wound infection and sinus infection. Of the cases of Table I. 14 appear in Table II., but only in 2 are the dates of bacteriological examination the same.

Table I. is a record of the latest bacteriological examination that was made in the given case, while Table II. gives the earliest examination made after the time of wounding. Various intermediate examinations were made in many of the cases, but these details are omitted from the tables for the sake of clearness. The tables show the bacterial flora met with in recently inflicted wounds and the organisms met with at long periods afterwards. In Table I. the bacteria found in 10 different closed cavity cases are also given. In these instances the external wound was entirely healed over, and the operation was undertaken for some surgical reason other than the presence of a septic focus; in fact, there were no evidences of any septic trouble. In none of the cases was operation followed by reaction, febrile or local. These cases are a curious control to the "sinus cases," many of which, certainly more than 1 in 10, showed a febrile reaction with local symptoms of inflammation, and it may well be that tissues still suppurating with an external open sinus are barely holding their own against the various bacterial agencies at work, whereas in the closed cavities the infecting organisms, though not destroyed, are shut off from causing trouble by a wall of protective tissue.

In addition to the B. malignant œdema and B. perfringens,* another anaerobic spore-forming bacillus with end spores closely resembling the B. tetani was isolated from 41 cases. This organism, originally described by Rodella,[3] and latterly carefully studied and described by Hibler as Bacillus IX., has received little attention by recent observers as an organism common in the wounds. In none of the 77 wound cases was B. tetani isolated, although organisms morphologically resembling it were common. The original egg-broth cultivations containing these end-spore organisms were kept three or four weeks and then inoculated into animals in all suspected cases, and in no instance did the animal develop symptoms of tetanus. In 2 cases only of clinical tetanus have characteristic symptoms followed the injection of cultures in guinea-pigs; neither of these cases is included in Tables I. and II. Dudgeon[5] claims to have found B. tetani in 11 out of 21 cases examined, and makes a number of deductions from the fact. Fleming[6] states that he found B. tetani in 22 cases out of 127 examined in the first seven days following injury, and 5 out of 56 examined between the eighth and twentieth day. Neither Dudgeon nor Fleming states the grounds of their diagnosis of B. tetani; they make no mention of animal experiments, which is regrettable. On the other hand, Dean[7] and Mouat observed the presence of B. tetani in 4 cases out of 18 examined (the day of disease is not mentioned); in all 4 cases the inoculation of animals produced typical symptoms of tetanus.

B. Hibler IX. was obtained in a high percentage of my cases; it produces considerable quantities of fœtid gas, but does not blacken autoclaved meat as does B. tetani. Its action on milk is extremely slow; tetanus produces digestion and precipitation of casein. The colonies of B. Hibler are smooth, round, and devoid of the woolly appearance characteristic of tetanus and B. malignant œdema. The organism forms curious large end-spores much like a fives racquet, but in the early stages the spores are often round, terminal and tetanus-like. If an attempt were made to diagnose the presence of tetanus by the microscopical appearance of the bacilli and spores the two organisms could be readily confused. Occasionally two spores may be seen in the same organism as shown in the photograph. (Fig. 3.)

B. malignant œdema.—The number of cases showing organisms of the B. malignant œdema type is 43. Considerable care was taken to determine this class, owing to

* This name is retained as priority undoubtedly belongs to Veillon and Zubert; B. aerogenes capsulatus, B. welchii are undoubtedly synonyms. See Robertson, Journal Path. and Bact., loc. cit.

FIG. 1.

B. malignant œdema (Koch). 48 hour egg-agar, showing subterminal spores and typical clostridial forms. Stained Gram × 1000.

FIG. 2.

B. pertringens (B. fraenkel, B. welchii, &c.). 24 hour glucose agar. Stained Gram × 1000.

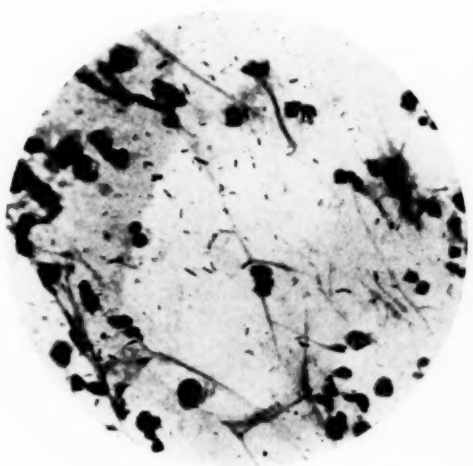
FIG. 3.

B. Hibler IX. (Rodella III.), showing end spores double. 72 hour glucose agar. The culture is not pure; a clostridial form of B. malignant œdema is seen on the right at 3 o'clock. Stained Gram × 1000.

FIG. 4.

B. Hibler IX. (Rodella III.), associated with large cocci; end spores of bacillus in formation, one double-ended sporing bacillus. 48 hour glucose agar. Stained Gram × 1000.

FIG. 5.



Pus film from a septic wound, showing numerous B. perfringens and a few end spore organisms, spores only partially formed and staining darkly. One is seen at 3 o'clock just above a pus cell. Stained Gram-fuchsin × 500.

FIG. 6.

Tissue preparation from a case of acute gas gangrene. The upper part of the photograph shows the disintegrated muscle bundle, the lateral part shows the muscle bundles only partially affected. "The bacilli are seen lying in the muscle bundles themselves." The left hand muscle bundle shows numerous sporing bacilli. Gram-carmine × 500.

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(The micro-photographs were taken by Mr. Cyril Hill.)

TABLE I.—*Sinus and Closed Cavity Cases.*

Case No.	Surgical condition.	Source of cultures.	Day of disease.	M.O.	P.	R.	P. group.	C. group.	Strep.	Staph.	Other.	Vaccine.	Result.	Day of disease.	Notes.
1	58c	Plated C.C.F. thigh.	Sinus in thigh.	302				+			+	—	Prot. aut.	Recovery.	...	Vaccine commenced early. 4 subsequent operations, one followed by secondary hæmorrhage.
2	18D	C.C.F. thigh.	,, ,,	285	—	—	—	—	+	+	+	Pyoc.	—	Seq. removed.	285	Secondary hæmorrhage 287th day. Recurrence, fever 5 days' duration.
3	71c	C.C F. tibia, plated.	Sinus in tibia, plate out.	275	—	+	—	—	+	+	+	—	—	Sinus unhealed.	562	Sinus curetted on several occasions; no general but intense local reaction.
4	31c	C C.F. radius, wired.	Seq. removed, wire out.	273	+	+	+	+	+	+	+	Pyoc.	4 inj only.	No "flare," 2nd op.	273	Readmitted with sinus and seq. Aut. strep. vaccine. Seq. removed.
5	47c	C.C.F. humerus.	Seq. removed.	269	+	+	+	+	+	+	•	—	+	No "flare," seq.	269	Seq. contained all organisms found in wound on first examination (4th day).
6	68D	C.C.F. femur.	Scraping from sinus.	236	—	—	—	—	—	+	—	+	+	Under treatment.	...	6 severe "flares"; autog. vaccine (streptococcus); 3 subsequent operations, no temp. rise.
7	57c	C.C.F. tibia, plated.	Sinus in tibia, plate out.	198	-	-	—	+	—	+	+	+	+	Recovered.	...	Two small operations to sinus followed by "flare"; vaccine; operation successful.
8	9D	C C F. tibia.	Sinus in tibia	189	—	+	—	+	+	+	+	+	Strep. Prot.	Death.	203	Streptococci in blood on 30th day; severe bed sores on 150th day.
9	70c	C.C.F. tibia.	Sinus, seq. present.	178	—	—	—	—	—	+	+	Pyoc	+	Under treatment.	...	...
10	35c	C.C.F. tibia, wired.	Sinus to bone (tibia).	177	—	+	—	+	—	+	+	—	+	,,	177	6 separate "flares," each following small operation to sinus, which persists on 177th day.
11	21c	C.C F. humerus wired.	Sinus to bone (humerus).	136	—	-	—	+	—	+	—	+	—	Recovery.	...	Slight general reaction following sinus scraping.
12	72D	C C.F. shoulder.	Sinus in upper arm.	109	+	—	+	—	—	+	+	—	+	,,	...	Severe reaction twice; erysipelas round wound on removal of small bone fragment.
13	86c	Sinus tibia to bone, C.C.F.	Sinus to bone (tibia).	176	—	+	—	+	—	+	+	Pyoc.	—	,,	...	Aut. vaccine; seq removed; no rise of temp. Considerable loss of bone in shaft of tibia.
14	82c	C.C.F. radius.	Sinus forearm to bone.	3 mths.	—	—	—	—	—	+	—	—	+	Under treatment.	...	...
15	83D	Sinus thorax.	Sinus to rib.	3 mths.	—	+	+	+	—	+	+	+	—	Death.	96	...
16	89c	C.C.F. tibia.	Sinus to bone (tibia).	4 mths.	—	—	—	+	—	—	+	—	—	Recovery.	...	Severe general and local reaction following sinus scraping.
17	87c	C.C.F. femur.	Sinus to bone.	3 mths.	+	+	+	+	—	+	+	—	—	,,	...	Acute gas gangrene followed opening up sinus and scraping.
18	59D	C.C.F. femur and pelvis.	Swab from sinus pelvis.	91	—	+	—	+	+	+	+	—	+	,,	...	...
19	37D	C.C.F. femur and hip-joint, plated.	Sinus to hip-joint.	80	—	+	—	+	+	+	+	—	Strep. Prot.	Under treatment.	...	Regular vaccine treatment from commencement; 2 subsequent operations; no "flare."
20	55D	G.S.W. ankle.	Sinus through ankle-joint.	70	—	+	-	+	+	+	+	—	,,	Recovery.	...	Gas gangrene, tetanus. Second abscess great trochanter.
21	10D	G.S.W. knee-joint.	Sinus knee-joint.	56	—	+	+	+	+	+	+	—	,,	,,	...	Second operation followed by "flare"; vaccine; two other operations, no reaction or "flare."
22	2D	G.S W. sacral fracture involving spinal canal.	Sinus into spinal canal.	52	+	+	+	+	+	+	+	--	Strep	Death.	56	Spinal canal opened, large abscess, and splintering of sacrum.
23	12c	C.C.F. both tibiæ, plated.	Scraping under plate.	41	+	+	+	+	—	+	+	—	Perf. Strep.	Recovery.	...	No reaction followed removal of plate and scraping bone.
24	54c	C.C.F. radius, many F.B.	Sinus to bone (radius).	41	+	+	+	—	—	+	+	—	--	Death.	48	Gas bubble in X ray photograph on 19th day. General septicæmia.
25	24A	Flesh wound calf.	Sinus scraping depths.	52	+	—	—	+	—	+	+	—	Strep Prot.	Recovery.	...	Vaccine 3 doses; transferred; vaccine discontinued. Wound broke down; readmitted. Vaccine again; sinus curetted, no reaction.
26	19D	C C.F. humerus	Sinus to bone (humerus).	55	—	+	—	—	—	—	—	—	,,	,,	190	Vaccine from commencement. B. perfringens in blood. No "flare" on subsequent operation.
27	56A	Flesh wound buttock.	Swab from depths of sinus.	39	+	+	—	—	+	+	—	Staph aur.	,,	...	Staph. aureus isolated from urine.
28	60c	C.C.F. thigh.	Scraping sinus to bone.	32	—	+	—	—	—	+	+	—	+	,,	...	Sinus twice opened, followed by "flare." Vaccine given 2 weeks; operation, no "flare."
29	63c	,, ,,	Sinus to bone (femur).	30	—	-	—	—	—	+	—	—	—	,,	...	...
30	1c	C.C.F. femur, wired.	Open wound, between bones	27	+	+	+	+	+	+	+	—	Strep Prot.	,,	...	Vaccine given from commencement. No "flare" on removal of wire.
31	91c	G.S.W. femur. involving rectum.	Sinus in femur to bone.	49	—	+	—	+	+	+	+	—	—	Under treatment.	200	Severe reaction with erysipelas on opening sinus. Vaccine. Sinus operated on 110th day; no "flare."
32	93D	G.S.W. skull, fracture.	Cerebro-spinal fluid, lumb. P.	257	—	—	—	—	—	+	—	—	—	Death.	271	Readmitted for medical board. Acute sudden onset. Streptococcal meningitis.
33	95D	Amp. r. arm, G.S.W. elbow.	Sinus in stump.	30	—	+	—	-	—	+	—	—	—	Recovery.	...	
34	78	Closed cavity in femur.	Swab from cavity.	6 mths.	—	—	—	—	+	—	+	—	—	,,	...	
35	85	Closed cavity in tib'a.	Piece of cloth in cavity.	164	-	—	—	—	+	—	-	—	+	,,	...	
36	73	Closed cavity, F.B. on rib.	F.B. from cavity.	147	—	+	—	—	—	—	-	—	—	,,	...	No general or local reaction following removal of sequestrum or foreign body.
37	84	Closed cavity in femur.	Seq. cavity (femur).	136	—	—	—	-	+	+	+	+	—	,,	...	
38	8c	Closed cavity, C.C.F. radius.	Pus aspirated from fract.	170	-	—	—	—	—	—	+	+	—	,,	...	
39	77D	Closed cavity, cerebral abscess.	Pus on opening abscess.	90	+	+	+	—	—	+	+	—	—	Death.	115	Hernia cerebi. 2 months after admission developed "fits." Operation abscess.
40	76	Closed cavity in rib.	Scraping and F.B. on removal.	92	+	—	—	+	—	+	+	—	—	Recovery.	...	
41	74	Closed cavity in tibia.	Cloth in cavity in tibia.	90	—	—	—	+	—	—	—	—	—	,,	...	
42	80	Closed cavity in femur, F.B.	F.B. from cavity in femur.	80	—	—	—	—	—	—	—	—	—	,,	...	No general or local reaction following operation.
43	81D	Closed cavity in spine, F.B.	Scraping from vertebra.	34	—	+	—	—	—	—	—	—	+	,,	...	
44	82D	G.S.W. skull, subdural cyst.	Pus on opening	3 mths.	—	+	+	-	—	—	+	+	—	—	,,	...
...	...	...	...	...	12	25	11	22	15	34	32	...	...	Deaths 6.	...	...

C.C.F., Compound comminuted fracture. M.O., B. malignant œdema. P., B. perfringens. R., B. Hibler (Rodella III.). Seq., sequestrum. F.B., foreign body.

TABLE II.

Inoculated Cases.

Ref. No.	Injury.	Bacteriology. Day of disease.	M.O.	P.	R.	Coli G.	Staph.	Strep.	Other.	Clinical appearance of pus.	Secondary hæmorrhage.
24A	Flesh w. through calf.	4	+	+	+	+	+	+	—	Brown, fœtid.	...
6B	Flesh w. thigh, N.B.I.	5	+	+	—	+	+	+	—	,, ,,	...
11B	Flesh w. right arm and foot, N.B.I.	5	+	+	—	+	+	+	—	,, ,,	...
20B	R.B.W. foot and arm, S.B.I.	5	+	+	+	+	+	+	+	Brown-black, very fœtid.	...
28B	S.W. thigh, N.B.I.	5	+	+	+	+	+	+	+	Brown, fœtid.	...
30B	R.B.W. thigh, N.B.I.	13	+	+	+	+	+	+	+	Livid, fæcal.	...
44B	R.B.W. arm, S.B.I.	12	+	+	+	—	+	+	—	Brown, slight smell.	...
15B	R.B.W. thigh, N.B.I.	3	—	+	—	+	+	+	—	Brown, fœtid.	...
1C	C.C.F. femur, M.B.I.	27	+	+	+	+	+	+	—	Very fœtid.	...
25C	C.C.F. arm.	66	—	—	—	—	+	+	—	Creamy, no smell.	...
16C	C.F. arm.	5	+	+	+	+	+	+	—	Brownish, fœtid.	...
31C	C.C.F. arm, M.B.I.	5	+	+	+	+	+	+	—	Brown, much smell.	...
43C	S.W. thigh, ankle, wrist.	7	+	+	+	+	+	+	—	Black, fæcal.	...
12C	C.C.F. both legs.	22	+	+	+	+	+	+	—	Brown, fœtid.	...
51C	S.W. shoulder, M.B.I.	5	+	+	+	—	—	+	—	Very fœtid, black.	...
52C	C.C.F humerus.	25	+	+	+	+	+	+	+	—	...
2D	S.W. back, M.B.I.	5	+	+	+	+	+	+	+	Very fœtid, black.	...
7D	C.C.F. both legs.	15	+	+	—	+	+	+	—	Very fœtid.	...
9D	C.C.F. leg, ankle, arm.	7	+	+	+	+	+	+	+	,, ,,	...
19D	S.W. shoulder, M.B.I.	10	+	+	+	+	+	+	—	Brown, fæcal.	...
37D	C.C.F. femur, M.B.I.	9	+	+	+	+	+	+	+	Brown, fœtid.	...
10D	S.W., C.C.F. thigh and knee.	19	+	+	+	+	+	+	+	Brownish, butyric	...
41D	S.W. amputation shoulder.	6	—	+	—	+	+	+	—	,, ,,	...
26D	R.B.W. pelvis, S.B.I.	5	+	+	+	+	—	—	—	Brownish, fæcal.	...
24	...	...	21	23	18	21	22	23	8	...	...

Uninoculated Cases.

Ref. No.	Injury.	Bacteriology. Day of disease.	M.O.	P.	R.	Coli G.	Staph.	Strep.	Other.	Clinical appearance of pus.	Secondary hæmorrhage.
13A	Flesh w. calf, N.B.I.	2	+	+	+	+	+	+	—	Discoloured, stale.	Day. ...
32B	R.B.W. thigh, N.B.I.	8	+	+	+	+	+	+	—	Brown, fœtid.	17
46B	Flesh w. shoulder and arm.	7	+	+	—	+	—	+	—	Brown, slight smell.	...
29B	R.B.W. foot, N.B.I.	7	—	+	—	+	+	+	—	Discoloured, no smell.	...
34B	S.W. thigh, N.B.I.	5	+	+	+	+	+	+	+	Brown, fœtid.	...
14B	R.B.W. arm, N.B.I.	6	+	+	+	+	+	+	+	Yellowish, no smell.	...
21C	C.C.F. humerus, M.B.I.	8	—	+	+	+	+	+	+	Brownish, smell.	...
50C	C.C.F. femur, M.B.I.	84	+	+	+	+	+	+	—	Brown, no smell.	...
27C	S.W. thigh, very severe, S.B.I.	5	—	+	+	+	+	+	+	Brown, much smell.	10
42C	C.C.F. arm, rad. and uln.	6	+	+	+	+	—	—	—	Brown, fœtid.	...
23C	C.C.F. arm, flesh w. leg.	5	+	+	+	+	+	+	—	Black-brown, fœtid.	...
38C	C.C.F. arm, rad. and uln., M.B.I.	17	+	+	—	+	+	+	—	Brown, much smell.	10
49C	S.W. thigh and arm.	7	+	+	+	—	—	—	+	Brown, fœtid.	...
53C	C.C.F. leg.	40	+	+	+	+	+	+	—	,, ,,	25 & 40
47C	C.C.F. humerus, M.B.I.	4	+	+	+	+	+	+	+	Brown-black, fœtid.	...
35C	C.C.F. tibia.	10	+	+	—	+	+	+	—	Brown, fœtid.	...
22D	C.F. skull, cerv. vertebra.	8	—	—	+	+	+	+	+	Greenish, no smell.	...
67D	C.C.F. tibia.	31	—	+	+	—	+	+	—	Brown, fœtid.	38
54D	C.C.F. rad. and uln., multiple shell w.	41	+	+	—	—	+	+	—	Greenish, no smell.	...
17D	S.W. shoulder, M.B.I.	7	+	+	+	+	+	+	—	Black, much smell.	...
18D	C.C.F. femur, M.B.I.	29	+	+	+	+	+	+	—	Black, very fœtid.	289
4D	C.C.F. femur and knee, M.B.I.	60	—	+	—	—	+	+	—	Creamy, no smell.	62
3D	S.W. amputation shoulder.	5	+	+	+	+	+	+	+	Brown, fœtid.	13 & 16
23	...	...	17	22	17	19	20	21	8	...	8

NOTES.—*No. 24A.*—Readmitted 52nd day. Sinus. *No. 20B.*—V 4 inoc. Recurrent T. 28th day in auxiliary hospital. *No. 2D.*—Death 56th day. *No. 9D.*—Death 205rd day. Streptococci in blood. *No. 19D.*—B. Perfringens in blood.

NOTES.—*No. 32B.*—Death, gas gangrene, 28th day. *No. 38C.*—Death, gas gangrene, 9th day. *No. 38C.*—Recovery. *No. 22D.*—Death 14th day. *No. 18D.*—Recovery. *No. 4 D.*—Amputation through knee 72nd day. *No. 3D.*—Recovery.

N.B.I., No bone injury. S.B.I., Slight bone injury. M.B.I., Much bone injury. S.W., Shell wound. F.W., Flesh wound. R.B.W., Rifle bullet wound. C.C.F., Compound comminuted fracture. C.F., Compound fracture. M.O., Malignant œdema.

the fact that the observation was in conflict with several other observers. Thus Fleming says he was unable to find "vibrion septique" in any of his 32 cases although the drawings he gives, especially of the clostridial forms, are highly suggestive of Koch's malignant œdema, while the slender end-sporing organisms with oval spores are indistinguishable from Hibler's organism—in fact, from a mixed infection resembling Fleming's drawing (Fig. 1, p. 640) I have isolated in cultures sufficiently pure to determine their biology, B. perfringens, B. malignant œdema (Koch), and B. Hibler.

Dudgeon,† in discussing the bacterial flora of 21 cases records B. aerogenes capsulatus (B. perfringens) in 10 cases. In the two cases he quotes, which were presumably sinus cases, one on the sixty-fifth day and the other on the forty-ninth day of the disease, B. tetani is associated with B. coli in one case and B. proteus in another; no organisms resembling B. malignant œdema are mentioned.

Robertson,[9] in a résumé of an extended research on anaerobe bacteria in the discharge from septic wounds, had no difficulty in isolating an organism corresponding in its main characters with the B. malignant œdema of Koch, and was able to differentiate this organism from B. perfringens and B. Hibler, but lays stress on the extreme difficulty in obtaining pure cultivations of B. perfringens and B. Hibler. This has been my own experience; even when after continual plating an apparently pure strain is obtained, a few weeks' culture on egg medium[9] usually results in the recrudescence of B. malignant œdema. The organism isolated agreed with that described by Miss Robertson.

It may be stated, therefore, that three types of sporing anaerobes at least are frequently found in the infected wounds having biological characters of considerable divergence. (*a*) B. malignant œdema primarily a protein digester, and in addition liberates ammonia in considerable amount. (Dale.[10]) (*b*) B. perfringens an acid producer; butyric and other acids are formed from the attacked meat; gelatin is liquefied but not coagulated serum; gradual digestion of meat occurs. (*c*) B. Hibler causes slow digestion of meat with acid reaction, no liquefaction of coagulated serum.

These biological activities are of the utmost clinical importance, for although the consensus of opinion of most observers is that B. malignant œdema and B. perfringens are extremely variable in their pathogenicity, their biological activity is apparently more constant, and may be as important as the pathogenicity of the associated aerobic bacteria. The persistence of these anaerobes in sinus cases, especially in the sequestra, for long periods has been demonstrated during my researches set out in Table I., indicating that the persistence of anaerobes in sinus cases is greatly furthered by the presence of sequestra. In one case only was the anaerobic flora associated with symptoms of gas gangrene which supervened upon operation. The cases recorded show that anaerobic bacteria are common in sinus cases, that they may even be found in closed cavity cases, and that the organisms are found at very long intervals after the original

† THE LANCET, June 12th, 1915.

wound, when all clinical symptoms of fever and other constitutional disturbance have disappeared.

Bacteriology of Sinus and Closed Cavity Cases.

Chronic sinuses, often determining general constitutional disturbance when operated upon, are very common, and the problem of dealing with them is urgent. Owing to the splintering of bone and the amount of bruising suffered by the soft parts, the initial stage of healing in many wounds is frequently greatly delayed, the purely mechanical damage to the tissues promoting the sequestration of micro-organisms in fragments of bone and developing granulation tissue. Not only are nooks and crannies present in the interior of severe wounds, but the granulation tissue thrown out by the injured surface is indolent, low in resistance, and while invading organisms become phagocyted by the wandering cells by no means all are destroyed. In a recent publication Peyton Rous and F. S. Jones [11] call attention to the protective action of living cells upon bacteria. Experiments with a specific hæmolytic serum and the appropriate red cells showed that the red cells when englobed by phagocytes were protected from the lytic action of the specific serum, although any cells remaining unphagocyted were quickly dissolved. Using trypan-blue as an indicator of the death of the cell, Rous and Jones were able to show that the cells which had taken up the red corpuscles were still living and exhibited considerable resistance to various destructive agents; the protection against the action of the homologous hæmolytic serum appeared to be a characteristic of the living cell. Testing this hypothesis with typhoid bacilli it was found that a concentration of N/150 potassium cyanide killed typhoid bacilli in a suspension of guinea-pigs' corpuscles without destroying the life of the corpuscles themselves, with the result that the bacilli contained in the cells were protected and grew when the emulsion was plated out, no growth occurring in the controls.

There is little doubt that continued reinfection of the walls of a sinus takes place through phagocytic action, and the difficulty of eliminating bacteria implanted in the granulating walls, so well known clinically, is explained by Rous and Jones's valuable observations. Moreover, the use of hypertonic salt solution, which invariably produces flabby granulation tissue when continued for extended periods, would seem to aid the sequestration of phagocytosed organisms. Hyperchlorites exert a solvent action on dead and partially dead tissue, and it is possible some of their activity is due to this action as well as their bactericidal properties. As a general rule during my investigation of sinus and septic wounds material obtained within half an hour after dressing with either iodine, peroxide, or saline has given substantial bacterial growth, but in very few instances have I obtained cultures within half an hour of hyperchlorite dressings.

From the clinical point of view the sinus case causes anxiety. Firstly, it goes on for a very long time, and although the patient may not be ill yet is entirely incapacitated from duty; secondly, attempts to close the sinus surgically may cause a "flare" or only result in further chronic suppuration; even a healed wound constantly breaks down again without any adequate surgical cause.

In September, 1915, Colonel Bond [12] called attention to the recrudescence of sepsis or local reinfection, and cites several cases where severe local inflammation followed trivial surgical procedure such as passive movement to a joint in the vicinity of an old wound. Colonel Bond [12] says: "Is the capacity of organisms to remain alive and virulent the result of the formation of fibrous tissue," &c.? and further: "Is the time interval of essential importance?"

Mr. Jocelyn Swan and myself [13] noted a series of cases of "closed cavities" in which a careful bacteriological examination was made. Cultures were obtained at operation from the cavities containing foreign bodies after complete healing of the entrance wound. Four of these closed cavity cases are included in Table I. (Nos. 34, 39, 40, 41). At the time that paper was published the investigation on sinus infection was proceeding. The research is still in progress, but sufficient details have been accumulated to warrant a preliminary communication. I have, therefore, collected into tabular form (Table I.) certain of the more important facts relating to the bacteriology of sinus cases and closed cavity cases, showing the day after the infliction of the injury upon which the bacteriological examination was made, the clinical variety of the injury, the organisms demonstrated, and some of the essential clinical notes relating to the cases. The organisms isolated are scheduled according to the grouping already given, and the letters and figures in the second column refer to the cases as classed under the four headings indicated above. The earlier bacteriology of the wound is omitted from Table I., but the details of 11 cases are given in Table III.

In many of these sinus cases bone injury had been a prominent feature of the original wound, and the cultivations in which anaerobes were obtained were made from the necrotic or exposed bone at the bottom of the sinus at operation. Cultivations had been made from the suppurating sinus from time to time before the removal of the sequestrum was undertaken, and these uniformly failed to show anaerobes. The organisms encountered in the soft parts of the sinus were mainly streptococci, staphylococci, and members of the proteus and coli groups. In only one instance (No. 17) did anaerobic infection follow operation; extensive incisions were made, including transverse muscle incision, and the case recovered. B. malignant œdema was present in the pus films in large numbers.

Sinus Cases which were Followed by "Flares" after Subsequent Operation.

In 13 cases (Nos. 1, 2, 6. 7, 10, 11, 12, 16, 17, 21, 25, 28, and 31) temperature reaction, in certain instances very severe, followed the operation. Two typical cases may be quoted:—

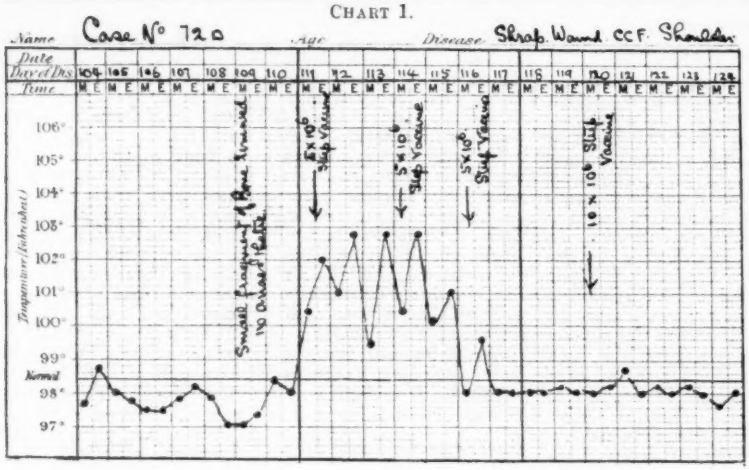
CASE 12 (72D).—Shrapnel wound of left shoulder with moderate bone injury. On the 80th day after injury a sinus leading to the damaged shoulder being present a small piece of bone was removed with sinus forceps. An acute attack of erysipelas came on within 48 hours associated with a severe attack of fever; the blush around the wound, arm and chest, remained for eight days. On the 109th day another small bone fragment was removed and a similar attack took place. (See Chart 1.) The bacteriological examination gave an almost pure growth of streptococci from the sinus; malignant œdema and B. perfringens from the extreme depths of the wound. There were no symptoms of gas gangrene or tissue emphysema. A dose of polyvalent streptococcal vaccine (5×10^6) was administered immediately after an examination of the pus films, and three days later 5×10^6 of autogenous sensitised streptococcal vaccine was injected. The temperature (see chart) rapidly fell; two subsequent doses of vaccine were administered. On the 122nd day some further pieces of bone were removed with no rise of temperature or other reaction. In this case there was good drainage of the wound, and the bone fragments removed were out of all proportion to the "flare" which followed. The case made a speedy recovery.

CASE 6 (68D).—The second case was not a gunshot wound, but a fracture due to a motor accident. The femur was put up on the second day, the tibia plated on the 12th day, and the stitches removed on the 22nd day. On the 29th day massage and movement of the knee were commenced, followed almost immediately by acute pain, and on the 32nd day an incision was necessary. Streptococci were present in large numbers. On the 43rd day another incision was made. On the 47th day the plate from the tibia was removed, which was followed by a very severe reaction with pus in the knee-joint. The autogenous vaccine prepared was given inadvertently on three occasions at intervals of 24 hours then discontinued. (Chart 2.) The febrile period lasted till the 81st day. Subsequent exacerbation of fever with local redness and increased pus development took place on four subsequent occasions. A reinvestigation of the bacteriology was made on the 236th day, and streptococci found present as before; a new autogenous and sensitised vaccine was prepared and administered at appropriate intervals. No further rise of temperature occurred, and three subsequent operations, including curetting the sinuses related to the knee-joint, were performed without any temperature reaction or local tissue inflammation, although at the last operation cultivations demonstrated the persistence of streptococci. No further "flares" have taken place, although two more operations were performed, and under the influence of the vaccine the indolent appearance of the granulation tissue has disappeared, and normal tissue is developing.

CASE 23 (12C) is an example of severe sepsis with compound comminuted fracture which finally recovered without sinus formation.

The tibia of both legs were plated and vaccine treatment with autogenous sensitised streptococcal vaccine commenced somewhat late (22nd day). A large secondary abscess was incised on the 49th day; the temperature fell to normal on the 76th day; one other abscess having been opened. From

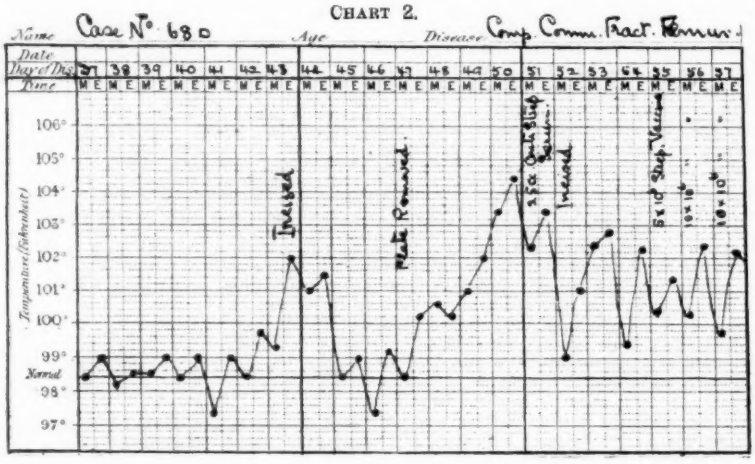
CHART 1.



this time to his transfer to a convalescent home on the 146th day no further rise of temperature took place and no sinus was present. (Chart 3.)

CASE 10 (35C) is of especial interest as it was a control case to 52C. (Table II.)

CHART 2.



The two men were readmitted on the same date (177th day of disease), the one with an entirely healed wound and no tenderness and complete, but irregular, union and no sequestrum. The control case, with a similar original wound and bacteriological picture, had two unhealed sinuses leading to bone; several operations and attempts to close the sinuses had failed. Bacteriological examination showed the presence of B. perfringens, B. proteus, and streptococci; an autogenous vaccine was prepared and administered. The case still under treatment has healed up twice, but has broken down again; no operation has been performed on the sinuses since vaccine therapy was commenced.

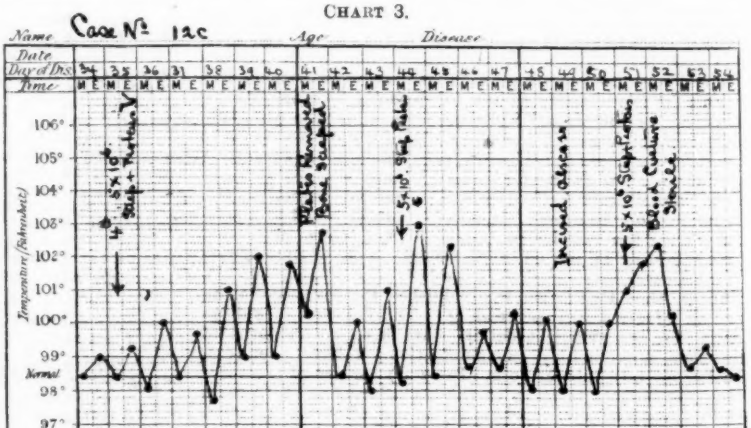
Administration of Appropriate Vaccine Previous to Operation.

In 22 cases in Table I. vaccine inoculation had been given at intervals for at least two weeks previous to "subsequent" operation; in no instance was the operation attended by any "flare." (Nos. 1, 4, 5, 6, 7, 8, 9, 10, 12, 14, 18, 19, 20, 21, 23, 25, 26, 27, 28, 30, 35, and 43.) In 8 (Nos. 1, 6, 7, 10, 12, 21, 25, and 28) of this series a "flare" had followed a previous "*subsequent operation*," but after the administration of the appropriate vaccine no disturbance followed the later operations performed. The case of cerebral abscess had no vaccine treatment until after the operation. Case 2D, severe injury to the sacrum, with an abscess cavity containing anaerobic bacteria in the spinal canal, received vaccine treatment, but succumbed to nerve degeneration caused by the original injury; for three weeks before death there was no fever. Cases 54C and 83D had no vaccine treatment, while 9D was treated with autogenous vaccine. This case developed large bedsores infected with B. perfringens.

The cases in Table I., 44 in number, comprise: (1) 33 sinus cases; (2) 1 cerebral abscess case; and (3) 10 closed cavity cases. None of the closed cavity cases suffered from constitutional disturbance following the exploration of the cavity and removal of the foreign body or sequestrum. The sinus cases include 29 which were operated on after they had come under observation; 15 were not immunised before the operation, and 13 of these "flared"; 14 were immunised before operation and none "flared." Eight of the 13 cases which "flared" required further operative treatment, and were accordingly treated with autogenous vaccines before the next operation was performed; none of these cases "flared." In no single instance, therefore, was any subsequent operation followed by a "flare" when previous appropriate vaccine treatment preceded the operative measures. All these sinus cases had suffered from severe tissue laceration when wounded, no doubt predisposing the local persistence of the organisms concerned in the "flare." The figures given are an example of the great advantage of vaccine immunisation as a preliminary to operative interference with the chronic sinuses.

There is also evidence that vaccine therapy is of value in the earlier stages of these wounds. In Table II. I have set out certain particulars relating to the vaccine treatment of 47 severe and septic wounds in their earlier stages. Although the general discussion of my observations on vaccine therapy

CHART 3.



is reserved for the second section of the report, Table II. has been introduced as some of the facts, especially the bacteriological findings, are of interest in relation to the later bacteriology of the sinus cases. Fourteen of the cases are ones that also appear in Table I., these cases are collected in Table III., and the first bacteriological examination made

TABLE III.

Persistence of Anaerobic Bacilli in Wounds. Eleven Cases.

Case.	Day of examination.	M.O.	P.	B.	Coli.	Strep.	Staph.	Day of last examination.	M.O.	P.	B.	Coli.	Strep.	Staph.	Site of culture.
21c	o 8	–	+	+	+	+	+	136	–	–	–	+	+	–	Pus from sinus.
47c	o 4	+	+	+	+	+	+	269	+	+	+	+	+	+	Sequestrum at operation.
35c	o 10	+	+	–	+	+	+	177	–	+	–	+	+	+	Scraping from sinus.
24A	v 4	+	+	+	+	+	+	52	+	–	–	–	+	+	Pus from sinus.
31c	v 5	+	+	+	+	+	+	273	+	+	+	+	+	+	Sequestrum at operation.
2D	v 5	+	+	+	+	+	+	52	+	+	+	+	+	+	Pus in sacral canal.
37D	v 9	+	+	+	+	+	+	80	–	+	–	+	+	+	Scraping at operation (bone).
10D	v 19	+	+	+	+	+	+	56	–	+	+	+	+	+	Pus from sinus (deep).
18D	o 29	+	+	+	+	+	+	285	–	–	–	+	+	+	Pus from sinus.
9D	v 7	+	+	+	+	+	+	189	–	+	–	+	+	+	Pus from sinus (deep).
19D	v 10	+	+	+	+	+	+	55	–	+	–	–	–	–	" " " "
11	...	10	11	10	11	11	11	...	4	8	4	9	10	9	...

v, Vaccine case. o, No vaccine.

subsequent to wounding compared with the final examination of the sinus or sequestrum. Three of the 14 cases are omitted from Table III., as the particulars of the bacteriology given in Tables I. and II. refer to an examination on or about the same date.

There is no indication in the results that the use of the vaccine in the early stages of the wounds had reduced the anaerobic flora of the sequestrum or sinus. In the cases in which B. malignant œdema persisted one was an injury affecting the sacral canal (2 D). Two were cases of sequestrum formation; no anaerobes were present in the *sinus pus*. One case was a simple sinus without bone injury, and only received two injections of vaccine before he was transferred to another hospital and the inoculations suspended. In seven of the eight cases in which B. perfringens and B. Hibler were recovered from the sinus at the final examination there was bone involvement; the cultures were obtained either from the sequestra or bone scrapings from the depths of the sinus. Six were vaccine and two non-vaccine cases.

The aerobic organisms showed no striking diminution in incidence. On the other hand, it would be unwise to deduce, therefore, that vaccine therapy had effected no beneficial result; in fact, it is doubtful if the presence or absence of a given organism determined culturally in a sinus, even where a specific antigen has been administered, is any test whatever of the benefit or otherwise of vaccine therapy. Many factors are concerned in the growth or persistence of organisms in a sinus. Rous and Jones's work points to one problem that deserves consideration; the physical impermeability of fibrous tissue effectually preventing the permeation of the bacterial-infected areas by the blood antibodies is a second; and the presence of a sequestrum is a third. That vaccine therapy has little direct action in affecting the flora of a sinus and none whatever upon formed sequestra may be concluded from the facts collected in the foregoing tables.

Effects of Vaccine Therapy.

Theoretically the production of antibodies by the injection of the appropriate vaccine depends upon the reactivity of the tissue into which the antigen is injected. A man, therefore, who is in normal vigorous health at the moment of wounding, and until the development of toxin and bacterial products in the damaged tissue has lowered his initial high resistance to bacterial invasion, may be regarded as a peculiarly favourable case in which to raise the specific resistance against specific forms of bacterial invasion. Theoretically the injection of appropriate antigen, if undertaken early, should produce an increased resistance—

1. *To general constitutional disturbance immediately following subsequent surgical manipulation of the wounded and infected tissue; a fortiori* when the local injury has become largely circumscribed by the natural protective action of the adjacent tissues.

2. *To the spread of the bacterial invasion in the immediate region of the damaged tissue*; the damaged tissue consisting not only of the actual wounded tissues, but the greater or less area which has suffered molecular disturbance without solution of continuity in direct proportion to the velocity of the projectile.

The evidence adduced in Table I. of the decreased liability to "flares" in cases in which vaccine therapy has been used systematically and the prevention of "flares" in cases which have already shown a "flare" following secondary operation gives good reason to conclude that the first of the above theoretical possibilities can be realised when vaccine therapy as an adjunct to surgical treatment is practically employed, and that the theoretical considerations suggesting the use of antigen inoculations coincide with clinical observation in properly controlled cases.

The second of the two theoretical premises stated above receives considerable support from the cases in Table II. These cases, which were selected in pairs generally from one convoy, showed similar bacteriological pictures and suffered from directly comparable injury, were for the most part treated under identical conditions as to surgical method, dressing, antiseptics, &c. The clinical history was obtained from the notes kept in the wards, and it was not until a table was compiled that secondary hæmorrhage was found absent in the inoculated cases and present in the controls.

It will be seen in Table II. that in the 24 cases treated with vaccines no case of secondary hæmorrhage took place, while in the 23 control cases no less than 8 suffered from septic secondary hæmorrhage. In two instances the hæmorrhage recurred 3 days and 15 days after the first attack. Of the 8 vaccine cases 6 were dressed with hydrogen peroxide, hypertonic saline, or saline and iodine; 2 were dressed with eusol. The 8 control cases were dressed in a similar manner; 2 only with eusol. Other treatment was exactly similar, and the injuries were strictly comparable.

Bacterial Flora of Wounds.

The cases of Table II. were for the most part wounded in the earlier part of 1915, at Neuve Chapelle, some in the battle of Loos. Recently the cases of secondary hæmorrhage have been less frequent and the bacterial flora of the wounds investigated somewhat less complicated. There is a general agreement in my series of cases between the time of year (and therefore the earth temperature) and the severity of the wound infection. This point will be dealt with in a later section. A glance at Table II. shows the very heavy infection found in the majority of wounds examined, and demonstrates that the bacterial content of the wound alone is by no means the only factor in the determination of severe local or even generalised infection. On the other hand, the cases of acute gas gangrene which have come under my own immediate observation in the acute stage have shown a preponderance of sporing bacilli with mid- or sub-terminal spores and many clostridial forms in the tissue smears (B. malignant œdema) or large Gram-positive non-sporing bacilli (B. perfringens).

In the sinus cases and the wounds without clinical symptoms of gas gangrene the Gram-positive anaerobes were not in the majority and sporing forms are not very common. Gram-negative bacilli were frequently seen, some of them probably degenerate forms of the B. perfringens and malignant œdema, others belong to the proteus and coli group. Streptococci are not often found in chain form except in the cultures; in the tissue smears they mainly appear as diplococci.

Fig. 6 is reproduced from a photograph of a tissue preparation from a case of acute gas gangrene. The bacilli are seen lying in the muscle bundles themselves, and a considerable area of semi-digested tissue surrounds the organisms. The appearance certainly suggests tissue digestion, and further supports the view already enunciated that the anaerobic bacteria in sinus cases are of more importance as *tissue digesters* than *tissue invaders*.

Conclusions of Section I.

To recapitulate briefly the conclusions of the first section of my report I find in septic wounds and in sequestra forming as the result of such wounds:—

(A) A preponderance of certain classes of anaerobic bacteria—namely, organisms referable to the groups: (1)

B. malignant œdema (Koch); (2) B. perfringens (Veillon); and (3) B. Hibler.

(B) A small incidence of B. tetani, at present only in cases of clinical tetanus.

(C) That wounded tissues, especially sequestra, contain anaerobic bacteria months after the original injury, even when the external wound has healed.

(D) That infection of the wounded and partially healed tissues with anaerobic bacilli predisposes to sinus formation.

(E) That persistent infection of wounded tissues is the chief, if not the essential, factor of the "flares" occurring after operations upon sinuses.

(F) That the use of appropriate vaccine therapy properly controlled is an important and urgent concomitant of surgical treatment in: (*a*) the prevention of "flares" after secondary operations; (*b*) the prevention of sinus formation; and (*c*) the prevention of secondary hæmorrhage.

(G) That the biological (digestive) activity of anaerobic bacilli is more important than the specific infectivity.

As a result of my investigations into sinus cases generally I would suggest the following routine treatment for chronic sinuses resulting from gunshot and other projectile wounds. The presence of bone involvement or sequestrum should be determined by radiography. If a sequestrum be present anaerobic organisms are almost certainly present. A bacteriological examination may or may not determine this point before operation, but the case should be treated as if anaerobes were present. An autogenous vaccine and preferably sensitised vaccine should be made from the organisms in the sinus; streptococci and the coli or proteus group when present must be included. If time is an object a stock polyvalent vaccine may be used, having regard to the bacteriological findings. Should the preliminary inoculation give rise to constitutional disturbance a "flare" would presumably have followed an operation undertaken without previous immunisation. Such cases should not be operated upon until efficient immunisation (three weeks at least) has been carried out. If no constitutional symptoms follow an autogenous (not stock) vaccine operative treatment may be proceeded with, as only the minority of such cases "flare." The doses of vaccine given should commence with 5×10^6 of streptococci, 10×10^6 of B. proteus, and 5×10^6 of B. coli. The inoculation should be repeated at 3–5 day intervals, increasing the dosage with reference to the clinical symptoms. Three days subsequent to the fourth dose the sinus should be surgically dealt with. Possibly excision of the sinus walls would give better results than scraping with a sharp spoon; in fact, the bacteriological and physiological considerations suggest this as the procedure least likely to contribute to further invasion.

From the results recorded in this report it would appear that the anaerobic bacteria, even if present in the sinus, may be disregarded providing proper precautions are taken (1) to immunise the patient before operation, and (2) to provide an efficiently drained wound.

The biological activities of the anaerobes do not apparently come into operation unless aerobic organisms, especially the proteus group, provide a suitable nidus or if tissue destruction (? scraping) cause already damaged tissue to die off. After operation hypochlorites (Dakin's[14] solution) may be used with advantage and the wound treated as an anaerobe-infected one.

All chronic sinuses which alternately heal and break down should be treated by vaccine therapy before subsequent surgical procedure is adopted.

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DIGITALIS IN AORTIC INCOMPETENCE.

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THIS is an old subject, but it is by no means threadbare. I have written and spoken on it in previous years, and have made contributions to our literature bearing on this disease, as other observers have done. But without wishing to appear didactic, I think it well to add my further experience to strengthen the views which I hold.

As one lives longer and sees more cases, and also registers the results of treatment, or the failures and successes of prognosis, one becomes more impressed with the value of clinical experience as against the theories of the laboratory or the seductive whisperings of a physiological instrument. So far as prognosis is concerned, there are some fixed opinions on the subject of valvular affections of the heart. And no opinion, so far as my experience goes, is so firmly established as is the seriousness of aortic regurgitation. Even in youth it is a lesion of the gravest character. But in a man or a woman upwards of 40 years of age, even should the causal disease have been only recently acquired, the outlook is always serious, though, as I shall show, some sufferers may survive to good old age. Perhaps I may put the whole question of prognosis in a single sentence by saying that in life assurance any applicant having aortic insufficiency should be "loaded" 100 per cent. if he be young, but if he be over 45 years of age his proposal should be rejected.

But not only is the prognosis always grave, not only must we admit that the sufferer has in the majority of instances a shortened span of life, but that all who have had opportunities of observing these cases and of recording their longevity must also be convinced that the immediate prognosis is one which requires cautious utterance. The various eddies, cross-currents, and commotions in the stream of life are complex and beyond our control. Hence, a violent emotion, an exciting episode, or a sudden muscular effort may bring disaster to the sufferer from aortic incompetence, notwithstanding that to all outward appearances he may hitherto have been in the enjoyment of a fair amount of health and with little or no distress. The patients who do fail under these adverse circumstances die suddenly, suffering little or no pain themselves; but, on the other hand, many survive beyond middle age and lead useful if not laborious lives.

I have now for many years past been observing and recording the life-histories of patients who have suffered from aortic regurgitation and who still survive or who have survived to a recent date. I have, so far as I could obtain information thereof, made notes of their ages when death overtook them; and I have, in many instances, ascertained the form of death, whether sudden or lingering; and also have I specially inquired whether digitalis had been administered during the last, or fatal, illness; or whether death occurred without warning and without any special cardiac treatment. And here I may observe that careful inquiry will reveal the facts that many sufferers from aortic incompetence are unaware of the fact; that they do not seek medical advice for any symptoms referable to heart disease; and, further, that many of them perform arduous work, entailing prolonged muscular exertions, without distress or discomfort. The experience of the French military doctors, as recorded in THE LANCET of Jan. 30th, 1915, proves all this. The soldiers who had been on active service and were sent to hospital from the front were admitted to hospital for fatigue, and not for palpitation, arrhythmia, angina, or pulmonary engorgement; some even returned to the trenches.

From this it must not be inferred that I do not recognise the grave position in which these sufferers live, and that sudden death is not common with them, even amongst those who, though suffering from a serious heart lesion, yet earn their livings, and who apparently enjoy their lives with no discomfort. But even amongst these—that is to say, patients who have no or very little discomfort—I strongly suspect that if careful observations be made it will be found that the mitral valve is also incompetent. It will not do, so far as my experience goes, to say that a given patient has

aortic incompetence, and this being such a serious affection our whole attention must be given to it, any other valve lesion being of minor interest and importance.

I have for many years tried to show that aortic incompetence by itself is not only a most serious lesion, but also that its gravity and its discomfort are enhanced if the mitral valve is holding and competent. This may appear to be a paradoxical statement. But I have abundant evidence, derived from observing numerous cases, to convince me that mitral regurgitation is really a boon to sufferers from aortic regurgitation. Some argue that two lesions cannot be more advantageous than one. I am not so sure of this. We see compensatory hypertrophy, which is obviously an abnormality, in certain muscles when the spinal column is distorted. It cannot be said that a hypertrophied left ventricle is a healthy or normal condition, yet it obtains in chronic kidney disease with changes in the arterial system. I often wonder how a long-distance runner would complete his course without the so-called "physiological" action or overflow of his tricuspid valve, by which his labouring right ventricle is relieved. This phenomenon is one of the first things which we learn in our text-books.

Transferring our attention to the left side of the heart, we can then recognise how a bicuspid valve (mitral) may, by its leakage, allow a similar relief, a lessening of centrifugal tension, notwithstanding that it is pathological. Even allowing that this is conjectural, I have records of many cases, in early middle age, who have led, and who still lead, lives of comparative comfort, they having the double lesion; whilst, on the contrary, others having only an aortic incompetence, suffer dyspnœa, faintings, and other discomforts, and are incapable of any beyond the slightest exertion. If there is one fact which has impressed itself on my mind when studying cardiac affections it is the comfort which an imperfect mitral valve bestows on a patient who has an incompetent aortic valve also. Let me admit, however, that I have no scientific proofs of these statements. I can only record clinical experience. Here are two cases in brief detail.

CASE 1.—An insurance clerk, now aged 27, had chorea at the age of 11. He was known to have a "weak heart." His father brought him to me when he was 18, with a view to ascertain what occupation he was then best fitted for from a physical point of view. I found that he had unmistakable signs not only of aortic refluent disease, but of mitral regurgitation in addition. He has been in his present employment now for upwards of nine years; he has suffered from no dyspnœa, angina, or œdema, and he recently told me that he could run upstairs without discomfort, and that he often had to race uphill to catch his morning train to London. I can see no reason why this young man, knowing his infirmity and taking proper precautions (I have scolded him for disobeying my orders about running), should not live in comparative health and comfort to at least middle age, and possibly longer; though his life must always be regarded as a precarious one.

CASE 2.—The patient, a man aged 39, was seen by me 17 years ago. He had typical signs of aortic regurgitation due to an attack of acute rheumatism when he was 20. The mitral valve then was apparently intact. I saw him again last year, after he had had a second attack of rheumatic fever. I then found that he had a systolic murmur, loudest at the apex, distinctly heard at the angle of the left scapula, and attended by accentuation and reduplication of the second sound over the pulmonary artery. The signs of his old aortic incompetence were also quite evident. He came to see me more with the view to ascertain my opinion as to whether he could be employed as a builder's foreman; and, singularly enough, he volunteered the statement that, since his second attack of rheumatism, he had had less dyspnœa, and was more able to perform active duties than during the period between his first and his second attacks.

By some physicians my conclusions may be classified as speculative only. But, as Darwin has shown, no good or original observation can be made without some speculation. The brilliant discoverers of the origin of malarial fever, of plague, and of other devastating diseases only made speculative and conjectural observations at first. Others, again, have effected cures by means of serum-therapy, by the administration of drugs and of glandular extracts; but the scientific proof of how the various diseases are thereby cured has yet to be divulged. Similarly one may object to the statements of clinical events (I call them events rather than facts for the present) as not yet capable of scientific proof. But I contend that if there be an overwhelming amount of good evidence in favour of one or against another certain line of treatment, then we must accept facts and wait for their elucidation by experimental proof till some future period.

The efficacy of a drug in the majority of instances has been ascertained by clinical experience rather than by laboratory research. The effect noted by a certain drug on the heart and pulse of a dog is not conclusive that a similar effect will be produced on a human's circulation by the same drug. Some animals consume what are to us poisonous plants with impunity, and I have little doubt that the converse applies. Therefore, I contend that one's experience should guide us in giving advice in the treatment of disease. Experience, after all, is a firm bed-rock on which to base statements, dogmatic or didactic though they be. The mason builds from below; he knows really nothing of the laws of gravity, yet he has the intuition that if he attempts to build in any other manner disaster awaits him. When the keystone is in position he may then survey his work with satisfaction, and may with greater ease and understanding listen to the explanation of the laws of thrust, expansion, and other varying forms of what is really gravity. If the opinions of some others differ from mine I must accept them, but I can accept no surmise; I must have quoted facts derived from records of cases which have been carefully observed.

To my younger confrères, therefore, I would say: "Keep notes of your cases of aortic insufficiency, record their longevity, their modes of death, whether sudden or lingering, and compare a series of cases treated by digitalis with another series of cases in which the drug has had no place in the defence." Obviously I am only referring to those cases of aortic regurgitation which, in the opinion of the medical attendant, require medication—cases which show signs of ventricular dilatation and cases in which attacks of dyspnœa come and go, and even those cases in which the medical attendant may, and often does, say with perfect faith, "Your heart requires a tonic from time to time, therefore keep this prescription in your pocket and occasionally take the remedy." I wish to caution such doctors. Sudden death in these cases is by no means uncommon. I have received not a few letters from younger practitioners in which they have related cases of sudden death, although no sign of such an impending event was manifest. But their consolation was: "My teacher always advocated digitalis in these cases"; or "Dr. So-and-So, under whom I studied, was in the habit of prescribing the drug." And this places me in a difficulty, for I know that eminent men have been quoted. But I will make one qualification—a qualification which I have made before—to my objection to the use of digitalis in aortic regurgitation. If in addition to aortic insufficiency the patient has also mitral regurgitation, then digitalis is a useful remedy.

Now the chief object of this communication is to put on record some addition to the number of cases having aortic regurgitant disease who have survived to old age and to whom digitalis has never been given since I have had them under observation, now some 10 to 15 years. I prefer to leave out any further record of cases which after a course of treatment by digitalis have died suddenly, as such a record might occasion some distress. I have had it said to me that better authorities than I have advocated the use of this drug in case of threatened cardiac failure, even when the cause thereof was simple aortic regurgitation; that even in those cases which, after a regulated course of the remedy, do die suddenly, it was only a natural event, one to be almost anticipated, and not due to digitalis. All I can do in reply, is to mention that I have received letters from doctors, and have records of cases, confirming my experience; and, what to my mind is stronger, evidence is obtained from the experience of cases which survive, or have survived, to old age, without their having had a single dose of digitalis. It will therefore be well if I record three more such examples.

CASE 3.—A wealthy gentleman, with every worldly comfort, was first seen by me when he was 69 years. He had every sign of aortic regurgitation—diastolic basic murmur, shaking carotids, capillary pulsation, Corrigan's pulse, &c., but his mitral valve was intact. During the whole of the period, nearly 20 years, in which I had him under observation with his doctor, he never had a single dose of digitalis; and although he had, from time to time, attacks of dyspnœa, these were successfully encountered by small doses of trinitrin (gr. 1/200), and a very diminished dietary, usually about a third of his daily food, with one day's fasting in

each week. He survived to the age of 88½ and died gradually, as though worn out.

CASE 4.—The patient, a twin (female), aged 79, was first seen by me 15 years ago. She had, and has now, all the cardinal signs of aortic incompetence, but with no evidence of mitral regurgitation. The physical signs are also accompanied by characteristic symptoms, such as periodic attacks of breathlessness, palpitation, with insomnia or nightmare. I advised treatment similar to that which is outlined in the preceding case. She still survives, and is in her eightieth year.

CASE 5.—The patient, a female, was first seen by me in 1901 suffering from dyspnœa, accompanied by signs of aortic regurgitation, with crackles at the base of each lung and a tendency to anasarca. I had a suspicion, from the existence of certain well-known physical signs, that her mitral valve was not holding completely, this suspicion being strengthened by the signs of back pressure. Still, acting on my advice and wishes, digitalis, although suggested, was not given. I hear that she died last year in her eighty-seventh year.

Here are three remarkable cases, all octogenarians, who suffered from grave valvular affection, for which probably many practitioners would have from time to time prescribed digitalis, since it will be noted that these cases were not without symptoms of distress, that they were not examples of cases which we frequently see in whom, though the aortic lesion is well marked by physical signs, there were no urgent symptoms. All three consulted me on account of serious indications of distress, which returned from time to time and which called for relief.

These cases, if they show nothing else, illustrate how many people, notwithstanding serious cardiac ailments, may live to good old age by careful treatment and management.

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ABDOMINAL PREGNANCY, PROBABLY PRIMARY.[1]

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THE recent researches on the embedding of the human ovum and the definite proof of the existence of ovarian pregnancy, established by quite a number of recorded examples, have been the means of altering the attitude which has hitherto been adopted towards the possibility of primary abdominal pregnancy. It is now affirmed that the ovum will embed itself in any patch of connective tissue capable of supplying its nutritional demands. That a pregnancy is primarily abdominal is difficult to prove, but it is also difficult in certain examples to disprove; for in the light of modern knowledge we can no longer cling to the old statement that "all cases are primarily tubal." If, further, a detached ovum, and therefore a damaged ovum, can become implanted and grow on the peritoneal surface, why not a fresh ovum? Now, the situation in which this implantation would be most likely to occur is the upper part of the posterior surface of the uterus. An entirely erroneous impression of the position of the appendages is apt to be gained by a study of illustrations as well as by examination of post-mortem specimens. In the healthy living woman the tubes are curled around the ovaries, and the latter are in close proximity to one another and to the back of the uterus. There are, of course, variations in position within normal limits, but their close proximity is maintained and the ovaries may be actually in contact with one another as well as with the posterior surface of the uterus. It is further necessary to suppose that there has been damage to the uterine peritoneum, as the healthy peritoneum is alleged to exert a protective function. There are, I fancy, few parous women who escape a microscopic if not a macroscopic damage to their peritoneal epithelium. Further, the ovum has become implanted at the fimbriated extremity of the tube, on the surface of the ovary, in a Graafian follicle, and, as demonstrated by one of my own specimens, in the functionally active portion of an ovary, the seat of a cystoma.[2] It is therefore not difficult to imagine that it may become implanted in the posterior surface of the uterus.

As a contribution towards the study of this subject let me record the following example. Dr. M. F. Huston, of Harrow, has very kindly furnished me with some facts concerning the patient's previous history, which I give in his own words:—

"She was aged 35 years and had had three confinements, all, as I understand, normal and of short duration, the last two years ago. Her menstruation ceased at the end of July, 1915. In August and September, 1915, she had an attack of meningitis, probably cerebro-spinal, although the meningococcus was not found. I was first called to see her on Friday, April 28th, 1916, and was informed that the 'waters' had come away the previous evening while the patient was at tea. There had been very slight labour pains, but these had passed away, and from the description it was doubtful whether they were labour pains or not. During the night the patient had been sick several times. The bowels had acted well with enema. She complained of pain in the epigastrium, but no labour pains. On examination she was found to be in fairly good general condition, colour good, pulse 96, abdomen apparently that of a woman at full term. The child could not be definitely felt by abdominal examination, although there was a hard mass in the left side which suggested the head. No movements of a fœtus could be felt, although she stated that she felt movements distinctly up till the preceding day. On vaginal examination the os was only enough dilated to admit the tip of one finger. No presenting part could be felt and there was no external hæmorrhage."

On Saturday and Sunday the patient's condition remained much the same, her chief complaint being epigastric pain, vomiting, and sleeplessness. On the Sunday morning about two teaspoonfuls of blood had been passed per vaginam. No decidua had been expelled. On Monday, May 1st, I was summoned to see her by Dr. Huston, as her condition had become worse. She was a small, pallid, spare woman, and was sitting up on a chair with her feet resting on the edge of her bed. She complained of pain in the epigastrium and informed me that she had been unable to retain any food. A monthly nurse was in attendance and all preparations had been made for her expected confinement. She was moved on to her bed with some difficulty because any attempt at movement seemed to cause considerable abdominal pains and distress. The abdomen was much distended and there was considerable venous engorgement visible in the abdominal walls. The abdomen was extremely tender on palpation, especially on the left side over the position of the fœtal head and at other points where the fœtus was palpable. It was however, difficult to make a detailed examination of the abdomen because of the extreme tenderness as well as the intestinal distension. The latter was so marked that what I took to be the transverse colon was visible and palpable, lying across the upper part of the abdomen. The outline of the uterus could not be defined, as the patient at once resented any attempted pressure. The breasts were somewhat atrophied and in appearance were not suggestive of pregnancy, and no fluid could be expressed from either nipple. On vaginal examination well-marked venous distension and blue discolouration were noted. The cervix was much softened and drawn upwards, and the os uteri, about the size of a five-shilling piece, readily admitted the finger. No presenting part could be felt on vaginal examination. Bimanual examination was unsatisfactory for the reason already given. The patient had an inguinal hernia on the right side and was wearing a truss. When the truss was removed and the hernia examined there was considerable local tenderness and the hernia could not be completely reduced.

From my examination I came to the conclusion that the patient was pregnant, but that the fœtus was lying obliquely in a thin-walled uterus, and that her acute symptoms, distension and sickness, &c., were due to a partial obstruction of the intestine in the hernial region. I gave directions as to feeding and ordered a sleeping draught, for she had been awake for three nights, and an enema of castor oil, turpentine, and soap-and-water, also recommending that if she did not improve she was to be admitted into Harrow Cottage Hospital.

I saw the patient again two days later, after her admission into the hospital, and found her condition somewhat improved. She had a better colour, her pulse, although rapid, was better filled, and as food had been withheld her sickness had ceased. The bowels had acted well, and in consequence the intestinal distension had decreased. In the hospital she was under the care of Dr. S. H. A. Lambert, who had also seen her at her own home, and he agreed with me in thinking that her general condition had improved. I

[1] A paper read before the Section of Obstetrics and Gynæcology of the Royal Society of Medicine on June 8th, 1916.

[2] Proceedings of the Royal Society of Medicine, May, 1913, p. 229.

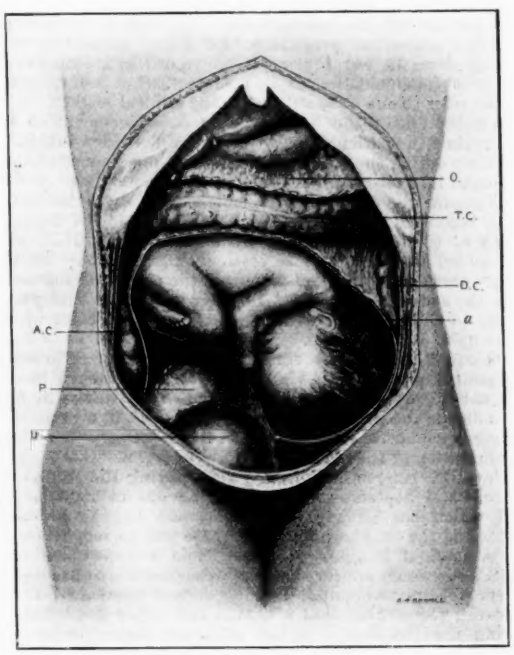
made a further abdominal examination but was still unable to define the outline of the uterus owing to the tenderness and intestinal distension. The tenderness was still most marked when pressure was made on any part of the fœtus. I again advised a policy of delay, and although it occurred to my mind that a rupture of the uterus was a possibility the history and the absence of signs of internal hæmorrhage made me decide against it.

Four days later I was summoned by Dr. Lambert, who informed me that the woman had not improved, and that he wished me to see her again. When I saw her she looked pinched and anxious; her pulse was 130, and she informed me that she could not sleep. I again examined the abdomen and succeeded for the first time in palpating the uterus, as both the abdominal tenderness and the intestinal distension had markedly diminished. It was possible to palpate the bones of the fœtal head, which imparted a curious crackling sensation to the examining fingers. Bimanually the uterus was pushed somewhat to the right side and corresponded to the size of a five months' pregnancy, and as the fœtus was obviously extra-uterine I decided to open the abdomen without further delay. For two days an offensive purulent discharge had issued from the vagina and the general condition of the patient suggested the presence of a severe toxæmia.

Operation, May 7th, 1916.—A free median incision was made, and as soon as the peritoneum at the upper part of the incision was opened a small quantity of black blood clot presented. On enlarging the incision the umbilical cord, of a dark slate colour, bulged into the wound. The hand was introduced and a rapid exploration made. The fœtus was grasped by the legs and withdrawn without difficulty. It was a female, apparently of full development, and the skin of the chest was beginning to peel. The uterus was at once brought up into the wound and was found to be enlarged to about the size of a five months' pregnancy, with a well-developed placenta, to which the umbilical cord was attached, firmly inserted in its posterior surface slightly to the right side. As the broad ligaments on either side were free the uterus and placenta were brought into view without difficulty. A strong odour of ammonia was perceptible during the operation, suggestive of the presence of urine in the peritoneal cavity, although the amount of intra-peritoneal fluid was inconsiderable. The intestines were carefully packed off with sponges and a rapid supravaginal hysterectomy performed, leaving the appendages *in situ*.[3] The placental attachment seemed to fade away gradually on the lower part of the uterus, leaving the floor of Douglas's pouch covered only by the remains of the amniotic sac. Further remnants of the amniotic sac, brownish black in colour, were found on the posterior abdominal wall, the utero-vesical pouch, the descending and pelvic colons, the transverse colon and omentum, the ascending colon, and the peritoneum lining the abdominal wall. The peritoneum was thickened and dark in colour. The abdominal incision had opened into the amniotic sac, but the latter had evidently ruptured prior to the operation. The membranes attached to the placenta maintained their normal colour, and had fallen over its upper surface like a cover. The amniotic fluid had evidently become absorbed, there being only some dark sanious fluid in Douglas's pouch. Thus, although the amniotic sac had ruptured prior to the operation, it was not difficult to reconstruct the arrangement of parts. (See illustration.) Moreover, it was interesting to note that although the fœtus was dead and its skin beginning to peel, yet there were no adhesions of intestine or omentum to prevent its rapid and easy extraction. The small intestine seemed to be packed away in the upper part of the abdominal cavity. Some old blood clot was also cleared out of the utero-vesical pouch,[4] and as much of the amniotic sac as was readily detachable was removed. Two large drainage-tubes were introduced into Douglas's pouch and brought out at the lower end of the wound, while a veil of gauze was inserted above the tubes to assist in isolating the area to be drained. The abdominal wall was then closed and the dressings were applied. The patient bore the operation well and her pulse became slower and better after the fœtus and uterus had been removed. It was 96 at the end of the operation, whereas the average rate had lately varied between 120 and 130. Her good condition was largely due to the fact that the total blood lost during the operation probably did not amount to more than a tablespoonful. The anæsthetic was ably administered by Dr. Lambert, whilst Dr. C. M. Pennefather rendered me valuable assistance at the operation.

After-history.—At my visit on the day following the operation the woman looked better and expressed herself as feeling better. The pulse-rate was 98. She had had no sickness or abdominal distension. Her tongue was dry and she complained of thirst, still her general condition was as good as could be expected after such a severe operation. On the next day her general condition was much the same. I did not see her again, but was informed on the fifth day after the operation that her condition was very bad, and she gradually sank and died. For 12 hours previous to her death she was almost maniacal, shouting and exhibiting extreme restlessness. She had had no sickness since the operation. There had been no abdominal discomfort and the bowels acted well. A post-mortem examination was not permitted.

Description of the specimen.—The parts removed consisted of the fœtus and placenta together with the uterus removed by supravaginal hysterectomy. The fœtus was a female weighing 7 lb. and had reached full development within the abdominal cavity of the mother. It measured 14 inches from the vertex to the coccyx. The trunk and limbs were



Drawing illustrating the relations of the fœtus and placenta. A C, Ascending colon; T C, transverse colon; O, omentum; D C, descending colon; *a*, amniotic sac; P, placenta; U, uterus.

perfectly developed, but the head was enlarged, suggesting early hydrocephalus. The skin of the trunk was beginning to peel and was readily separable on handling, whilst it was also undergoing colour changes, bluish-black and greenish-yellow, indicating the presence of decomposition. The umbilical cord, 15 inches in length, was normally developed and was attached to a large well-formed placenta. The attachment of the umbilical cord was eccentric, being situated towards the left side. The main placental mass was perched like a cap on the upper and back part of the uterus, whilst it spread laterally outwards and still more downwards, so as to hide completely the uterine surface. The main placental mass measured transversely 5 inches, antero-posteriorly 3¼ inches, whilst the vertical measurement was 6¾ inches. The two layers, chorion and amnion, could be demonstrated in the membranes attached to the placenta. Owing to the peculiar arrangement of the membranes there was a part of the placenta at its lower extremity to which the amniotic sac was not attached. This part gradually faded away on the lower segment of the uterus posteriorly. The appearance of the placenta was otherwise normal, and it was firmly inserted on to the posterior surface of the body and fundus of the uterus. The uterus was enlarged and was, as stated, about the size of a five months pregnancy, but since immersion in formalin it had contracted considerably. Its walls were about 1 inch in thickness, and its cavity, widely patulous with smooth lining, contained a myomatous polypus, about the size of a walnut, springing from the postero-lateral wall on the right side. Did the polypus interfere with the occurrence of intra-uterine pregnancy? Thrombotic changes had taken place in the blood-vessels, especially on the right side, which tended to diminish the hæmorrhage at the operation. The uterine artery on the right side was not identified.

[3] The right tube, which was not identified, was probably incorporated with the placenta.

[4] The bleeding probably had its origin in a slight detachment of the placenta at its anterior border.

A historical study of the subject of abdominal pregnancy reveals the interesting fact that the older writers divide what they termed "ventral pregnancies" into two classes, the primary and the secondary. By primary is meant that class in which the fœtus is developed at once in the peritoneal cavity, while in the second class are included all those cases in which the sac originally located in the tube or ovary has ruptured and the escaped fœtus goes on developing in the abdomen. It should further be added that they believed in the existence of ovarian pregnancy. I have no doubt their views will be substantiated by further research and experience, as has already been accomplished by the study of ovarian pregnancy, and it will be established that although primary abdominal pregnancy is rare, yet that it does occur in the human female.

I do not say the example here recorded is or is not a primary abdominal pregnancy, for I can neither prove it nor disprove it, but I place it on record as a contribution towards the elucidation of this subject. Let me, however, again refer to one or two points in the clinical history. With the exception of the illness at the commencement of her pregnancy the patient had no acute pain, sudden illness, or fainting during the whole course of her pregnancy, and her husband informed me that she was remarkably well, and in this regard the history corresponds closely with that of the case recorded by the late Mr. J. W. Taylor in the Transactions of the Obstetrical Society of London for 1897. He concluded that a "gradual erosion or giving way of the upper part of the tube had permitted the escape of the ovum into the abdominal cavity." In other words, his theory was made to fall into line with the views as to causation which were upheld at that time. But with our present knowledge it is equally feasible to regard his case as one of primary abdominal pregnancy, a view which is strengthened by the clinical history. The absence of abdominal illness at any time during the course of such a pregnancy is, in my opinion, strong presumptive evidence in favour of a primary abdominal implantation of the ovum.

Now Dr. Huston assures me that during the illness in August and September, 1915, when he was in attendance, and which has already been mentioned in the previous history of the case here recorded, there was no suggestion of any abdominal trouble. Moreover, from a study of clinical histories it would appear that the abdominal fœtus has had a severe struggle to maintain its independent existence. It is, however, remarkable that a woman can enjoy good health during the gestational period when the fœtus is in her abdominal cavity covered only by its amniotic sac. Some recorded examples of abdominal pregnancy speak of the fœtus being free amongst the intestines. This I believe to be a faulty observation, for I should imagine that no fœtus would reach its full development unless enclosed in a sac, and as the latter is, as a rule, opened when the abdominal cavity is opened it is easy to conclude that the fœtus is lying free. Further, when the sac ruptures or the liquor amnii becomes absorbed, why do not the omentum and intestines adhere to the decaying fœtus? When the gestation is much prolonged this adhesion has been observed, but it would appear that for a long time no adhesions are formed.

Again, what is the explanation of the rush of waters when false labour set in? The amount was sufficient to soak the bedclothes when the woman returned to bed. Did it come through the Fallopian tube or tubes? In Taylor's case what he took to be the fimbriated end of the Fallopian tube was incorporated with the placenta, but the remainder of the tube could not be traced. I have not been able to trace any connexion between the right Fallopian tube and the placenta, but the tube on the left side was free and doubtless patent. Owing to the rapid growth of the placenta it is easy to imagine that a delicate structure like the Fallopian tube could be, so to speak, overgrown and incorporated with the placental mass, and this, I think, is worthy of consideration as an alternative to the view that the destruction has been due to tubal rupture.

The ovary on the right side could also be identified, but it is quite possible, too, that this organ could be destroyed by the placental growth. The ovary was smaller than that on the left side and was sclerosed and adhered to the broad ligament. Whether this had resulted from any interference with the ovarian circulation it is impossible to say. The left ovary was free and of normal size and was covered on its inner surface by the amniotic sac. The external surface of the left ovary and the fimbriated end of the left tube were outside the amniotic sac, at least no trace of the sac was observed on them.

Surgical Treatment.

I have already recorded an example of abdominal pregnancy in which a living fœtus at 4½ months was successfully removed.[5] The placenta was implanted in the posterior surface of the uterus, the floor of Douglas's pouch, and on the pelvic colon. Previous to the removal of the placenta the main sources of vascular-supply were controlled, including a large artery coursing down the posterior surface of the uterus, and then the placenta was rapidly separated and the placental site at once plugged with gauze; the raw surface on the intestine was treated by folding in the wall of the gut and overstitching with catgut. A gauze plug was left in the pelvis and was subsequently withdrawn during convalescence.

Thus, in dealing with the placenta two important principles should be followed: (1) to control the main vascular supply by preliminary ligature, and (2) to separate the placenta rapidly.

In the case here recorded the position of the placenta was ideal as regards surgical treatment, for by means of a supravaginal hysterectomy the vascular supply was controlled and the placenta itself removed. It was the toxic condition of the patient that militated against her ultimate recovery. The advice to wait until the child is dead and the placenta thrombosed is hardly in harmony with the trend of modern surgery; moreover, the presence of infection is a serious factor which may mar the success of a future operation. I think, therefore, that if the principle of preliminary ligature of the vascular supply be properly carried out there should be little difficulty in dealing with the living placenta.

When an abdominal pregnancy is diagnosed with a living child, should we wait until the child is viable? It is true that living children have been extracted and have survived, but there is no evidence concerning their future growth and development, and as many of the children in recorded cases have possessed deformities I believe the best practice is to operate at once as soon as the diagnosis is made.

In conclusion, it is a source of great satisfaction to find that it is from investigations made in this country that many of the interesting problems in the life-history of ectopic gestation have been unravelled, and that their elucidation forms a brilliant chapter in the history of British gynæcology. The name of Lawson Tait will for ever stand forth as a pioneer in the surgical treatment.

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[5] Proceedings of the Royal Society of Medicine, April, 1910, p. 149.

A MEDICAL LIBEL ACTION.—Mr. F. E. Forward, Mr. F. J. W. Sass, and Dr. W. D. Higson were plaintiffs in a recent action in the King's Bench Division in which they claimed damages for libel against the Women's Press, Dr. F. Moxon, Mrs. E. Pankhurst, Mrs. M. Tuke, Mrs. N. D. Fox, and Mrs. B. Sanders, who were sued personally and on behalf of the Women's Social and Political Union, the Scottish Newspaper Publishing Company, Limited, and Messrs. W. H. Smith and Son. The libels complained of were published in the *Suffragette*, and made what were in effect charges of cruelty in respect of forcible feeding administered to women prisoners on "hunger strike" in Holloway Prison, of which the plaintiffs at the material times were medical officers. Dr. Moxon, the author of part of the matter complained of, at first sought to justify, but later wrote a letter from France, where he is serving, withdrawing all charges against the plaintiffs. The defences of the Women's Press, Mrs. Pankhurst, Mrs. Tuke, Mrs. Fox, and Mrs. Sanders were struck out owing to their refusal to obey an order of the court. The Scottish Newspaper Press having apologised, a verdict was returned with regard to Messrs. W. H. Smith, upon which judgment was entered for them, and damages were assessed against the other defendants for £750 to be divided equally among the three plaintiffs. The plaintiffs are to be congratulated upon a result which amply vindicates their good name, and which was indeed a foregone conclusion. The untruthful, unbalanced, or deceived people who disseminated horrible accusations against members of the medical profession during the suffrage riots may possibly take warning.

INDICATIONS AND CONTRA-INDICATIONS IN THE PNEUMOTHORAX TREATMENT OF PULMONARY TUBERCLE.

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IN the year 1821 a distinguished British physiologist, James Carson of Liverpool, was urging on a seemingly apathetic profession the application of the newly recognised elasticity of the lung to practical therapeutic uses. He pointed out the serious obstacle which was presented by the physical state of the lung, its condition of extension, its elasticity, and its constant movement, to the healing of injury within it, and recommended its collapse to counteract these influences. Thereby, he declared, "the diseased part would be placed in a quiescent state, receiving little or no disturbance from the movements of respiration, which would be performed solely by the other lung, and the divided surfaces would be brought into close contact by the same resilient power which before had kept them asunder. A wound or abscess in the lung would be placed in circumstances at least as favourable to the healing process as the same affections on any other part of the body." He proved by experiment on rabbits that animals could live quite well with one lung collapsed, and recommended the treatment for "consumption," which, he pointed out, was often found in one lung only in the earlier stages. "In those cases in which the disease is placed in one of the lungs only, the remedy would appear to be simple, safe, and complete."

Nearly a century has gone by, and the brilliant foresight of Carson has at length received full recognition; not that so simple a theory as Carson put forward can be held fully to explain the value of pulmonary collapse in the treatment of phthisis, though the local effects he foreshadowed are by no means of negligible importance. The tuberculosis literature of the world has for the past five years concerned itself above all else with the brilliant results of the pneumothorax treatment of phthisis. But it is the continent and America that have supplied almost exclusively this literature. In the British Isles, it must be admitted, the treatment has hitherto provoked but little general interest, and the prophet Carson has received among his own countrymen just that amount of honour which the world's history might have led us to anticipate. A small band of pioneers, among whom the names of Colebrook, Lillingston, Vere Pearson, and Rhodes deserve special mention, have, indeed, long since planted the seed among us, but the harvest has been small, and the tuberculous Briton has been deprived, hitherto, of the blessings which his brilliant countryman promised a century ago, and which the remainder of the phthisical world now enjoys.

Since the success of pneumothorax treatment is bound up, above all else, in the selection of suitable cases, I have thought it worth while to put together here some of the general indications and contra-indications for this treatment, and therewith to present a description of a particular class of case where pneumothorax therapy seems peculiarly indicated, and leads especially to brilliant results. We may conveniently start with a consideration of these cases.

Clinically Unilateral Tuberculosis.

It is, one may suppose, common knowledge that the classical case for pneumothorax treatment is one of considerable one-sided disease, with the other lung clear, or nearly clear, to physical examination. Such cases supplied the earliest material for treatment, and they still form the backbone of this treatment when it is conducted on what I would regard as suitably conservative lines. But where, it may be asked, are such cases to be found? Experience teaches that in ordinary phthisis of adults disease has usually spread but a little way in one lung before it appears at the opposite apex, and there seems but little chance that the better lung can remain clear while the disease on the affected side is spreading itself over the whole lung from apex to base. Clearly these cases of advanced one-sided disease so suitable for pneumothorax treatment must be, in many cases at least, something other than ordinary apical phthisis, and their claim for consideration as a distinct group by themselves cannot afford to be disregarded.

For the sake of illustrating certain points characteristic of this group I will refer shortly to some of my hospital pneumothorax material, since this has been in the main composed of cases of advanced one-sided disease. Among 20 such cases, all adults, where the type of disease could be decided with some probability, 17 appeared to stand in a group by themselves and to present certain points of difference from ordinary apical phthisis. All of these cases showed disease covering the whole of one side, and in all of them the good lung was clear, or practically clear, of signs. In 6 no signs of cavitation were present to physical examination, but moist râles extended from apex to base, in 2 on the right side and in 4 on the left side. In 11 definite cavity signs were present to clinical examination, and in most of these cavitation was considerable, but in all the cavitation showed one striking peculiarity. In no case was it in proximity to the apex of the lung; in all the cavities were found comparatively low down in the lung. Among 4 with right-sided disease, in 3 cavitation was mainly in the axillary region and in the fourth at the base. In the remaining 7 disease was on the left side, and in 6 of these cavitation was just outside the heart, about the middle of the lung, in the axilla, or just above the heart. In one it was basal. In many of these cases no opportunity occurred for X ray examination before the lung was collapsed, so that the position of cavitation had to be decided by means of physical signs alone. Where X rays were used deep cavitation just outside the lung root was sometimes revealed. In one case a deep cavity just above the heart, near the neck of the left fifth rib, gave cavity signs at the surface over the same rib as far away as the axilla. In practically all the cases marked evidence of fibrosis was present, and displacement of the heart and mediastinum was demonstrable, especially, as would be expected, in the cases where cavitation had occurred.

The good lung was clear of stethoscopic signs in all these cases save for the presence of a few doubtful signs, which proved on further observation to have been conducted from the diseased side. The use of the X rays, however, soon dispelled all inclination to describe the better lung as "healthy" or even as "good." In all cases there was present a very definite peribronchial tuberculosis spreading out from the hilus, and often reaching two-thirds or even three-quarters of the way towards the surface. This disease of the better lung appeared to be in most cases an arrested or quiet process. Often it showed itself as a nodulated thickening of the lung reticulum, the nodules being in some cases fine, but in others coarser. Where the process was active larger shadows of lung infiltration were visible and the reticulated appearance failed. After some months' successful pneumothorax treatment these larger shadows tended to become smaller and denser and gradually to fall into a pattern which followed the lines of the ordinary network of the lung. Unlike cases of apical phthisis where the skiagram shows disease mainly occupying the lung between the root and the apex, in these cases the disease is seen to spread out in all directions from the root, and often to occupy mainly the middle third of the lung, or to branch in two or three directions of which the middle and lower are usually the most strikingly evident.

It appears to be the rule, then, that in these cases, in spite of negative stethoscopic evidence, there is present in the better lung a considerable amount of healed or quiescent disease. The appearance of this in a skiagram need in no way deter from pneumothorax treatment as long as the appearance suggests a quiet type of disease and physical signs are absent, for the results of treatment are commonly as good in these cases as if the lung was really healthy. With regard to the absence of physical signs, it is truly remarkable how near the surface of the lung this central disease, even of active type, may reach without either moist sounds or alteration of breath sounds giving notice of its presence. As far as the stethoscope gives warning we might be dealing with a healthy organ fully clear of disease. And in this respect these cases remind us at once of certain other tuberculous conditions where, in spite of central disease, stethoscopic signs are absent over both lungs instead of, as in the cases just described, over one side of the chest.

Hilus tuberculosis of children.—This is a condition where tuberculosis of chest glands is associated with a tuberculosis

spreading out into the lung. This is often a quiet peribronchial process of both lungs leading to but few and even no symptoms, though at any point a broncho-pneumonic process may arise and more acute disease supervene. In either condition stethoscopic signs of lung disease are generally absent in all but the later stages, and the presence of lung disease, apart from X ray examination, can only be presumed on other grounds. The chest signs, such as they are (impairment of note over the right side, right interscapular impairment, blowing breath sounds at the apex, &c.), are due to interference with certain lines of communication by glandular enlargement, and not to disease of the lung. In many cases evidence of deep lung disease is given by the presence of the reflex bands of impairment over the back described by me in a recent communication.[1] In adults such cases of hilus tuberculosis with glandular enlargement are uncommon, but they do occur and present similar signs to those outlined above.

Hilus tuberculosis of adults.—More commonly in adults a hilus tuberculosis occurs unaccompanied by any manifest glandular enlargement—a condition to which clinicians have hitherto paid but little attention, though the radiographer has long recognised it, generally under the title of "peribronchial tuberculosis." This seems to me an unfortunate nomenclature, for though tuberculosis spreading from the hilus is often largely or entirely of peribronchial type, yet a tuberculous peribronchitis may affect any region of the lung and cannot be considered the special prerogative of this central form of disease. The failure of the clinician to recognise this group of cases is due, as a rule, to his failure to diagnose them. In its slighter forms the disease may remain altogether subclinical. In more inveterate attacks it is very commonly of chronic and insidious course, and the main symptom often a progressive dyspnœa associated sometimes with chronic bronchitis and emphysema and with asthmatic attacks: indeed, in many of these cases proof of the tuberculous nature of the disease entirely fails, and the peribronchitis may very well be due to other causes of irritation. In cases more manifestly tuberculous the course, and the appearance on occasions of hæmoptysis, or of sputum containing tubercle bacilli, render the diagnosis of tubercle more certain. But the signs may be of the slightest and readily overlooked in earlier stages. Bronchitic râles are often present, and these may be more marked at, or even confined to, a limited area of the chest. The percussion note to light percussion may be a trifle less good at one apex or all over one side, and Krönig's apical resonance is nearly always narrowed on one or both sides, a most important sign. In addition the reflex bands of impairment described by me and already referred to are invariably present, and point to the presence of deep pulmonary disease which the X rays will generally render manifest.

Now it seems to be a variety of this hilus tuberculosis which supplies these cases of apparent unilateral disease so favourable for treatment by artificial pneumothorax. The spread through the lung is often, in all probability, a slow process marked by exacerbations and periods of arrest, and the surface is reached almost simultaneously all over the chest, giving signs over the whole side. But until this point is reached stethoscopic signs will fail, and the presence of disease must hence be often overlooked, or at least its nature unrecognised. It is probably only in the later stages that the toxæmia is sufficient to overcome tolerance and lead to "reactions," shown in fever and other symptoms, and in "focal reactions," whereby the vicious circle of active autotoxic tuberculosis is established under which the patient will soon succumb unless the toxæmia can be arrested. Hence the symptoms in these cases of very widespread, but evidently also long-standing, disease are often of much shorter duration than the amount and nature of disease would seem to warrant. A few months' history is often all that is obtainable in cases with extensive cavitation and with fibrosis leading to marked visceral displacement.

There is good evidence that up to a certain point—namely, the point where toxæmia definitely overcomes tolerance—hilus tuberculosis of adults is nearly always a disease of chronic course and favourable outlook, and far more amenable to suitable treatment than is apical phthisis. This tendency to arrest and cure shows itself strikingly even in such advanced cases as come under treatment by artificial pneumothorax. It is but seldom that disease in the better lung, even if this is of moderately active nature, fails to improve so soon as auto-inoculation is removed by collapse of its diseased companion organ.

Now, the recognition of unilateral tuberculosis as a clinical entity is no new or original discovery. In 1912 Straub and Otten,[2] working in von Romberg's clinic, published a careful description of this one-sided disease based on a study of 27 cases. Furthermore, they recognised its peculiar relationship to pneumothorax treatment, and included in their study an analysis of 99 cases treated by Brauer after this method. It will be well to consider shortly their descriptions of this type of disease. The main characteristics on which they laid stress are the fact that the apex is not the oldest focus, and that cavitation does not appear here but deep in the lung and at a lower level. They found that signs first appear over the front of the chest attacking, on the right side, the base of the upper lobe, or less commonly the middle and lower lobe, and on the left side the base of the upper lobe, especially in proximity to the outer border of the heart. They noted that there was marked tendency to fibrosis and displacement of organs, and that disease ran a more chronic course on the left side than on the right, often proceeding to cavitation without complaint of either cough, sputum, fever, or pain. On the right side they found disease spread through deep parts of the lung towards the axilla, but on the left side it tended at an early stage to reach the surface just above the heart in the second or third space near the sternal border, presenting signs of chronic disease, often with cavitation at this point. They recognised the relationship to hilus tuberculosis of childhood, and traced its development therefrom. Their 27 cases comprised many of early hilus disease in children and young people.

While agreeing in the main with the description of the disease supplied by these authors, a different experience on some points has persuaded me that their material and my own is too small to justify any hard-and-fast delineation of sub-types or minor peculiarities. Their main contention, however, falls in with my own experience—namely, that there exists such a definite "vom hilus ausgehende" form of disease of different course and different prognosis to so-called "apical phthisis," and that certain more virulent of such cases form the most notable material for treatment by artificial pneumothorax. An account of the more characteristic distribution, and hence the easier recognition of left-sided disease of this type an attempt was made by Straub and Otten to trace these cases among other tuberculous material within their reach. Among 135 cases of pulmonary tuberculosis examined by them 10, or 7·4 per cent., were left-sided cases of this type. Brauer's 99 pneumothorax cases showed 48 on the right side, and 51 on the left. Among the latter, 17, or 33 per cent., were certainly of this type, and a further 18, or 35·3 per cent., were very probably so. The results of pneumothorax treatment among the left-sided cases are analysed as follows:—

	Much improved.	Improved.	No change.	Died.
Hilus cases ...	10 = 58·8%	5 = 29·4%	—	2 = 11·8%
Probably hilus	10 = 55·5%	4 = 22·2%	—	4 = 22·3%
Not hilus ...	5 = 31·3%	3 = 18·7%	2 = 12·5%	6 = 37·5%

It is interesting to place beside these figures, although not strictly comparable, the results of ordinary hygienic-dietetic treatment among Straub and Otten's 27 cases.

	Much improved.	Improved.	No change.	Died.
All cases ...	2 = 10·5%	7 = 36·9%	3 = 15·7%	7 = 36·9%

Apical Phthisis.

After this brief description of a class of case of supreme importance to the pneumothorax therapist we may pass on to the indications for collapse of the lung in cases of ordinary apical phthisis. Here two points of contrast to the cases already described at once come into notice. Firstly, disease cannot be allowed to advance far without the opposite lung becoming involved in active disease. Secondly, there is reason to suppose that disease in the good lung is a more serious threat to successful treatment in apical phthisis than it is in the case of hilus tuberculosis. It has always remained

[1] THE LANCET, August 21st, 1915, p. 387.

[2] Beiträge zur Klinik der Tuberkulose, 1912, xxiv., 283.

somewhat of an enigma in pneumothorax treatment that, while in most cases disease in the good lung improves, in some disease is lighted up and increases. It has seemed to me probable that it is particularly in apical cases that the latter experience is apt to arise, disease being generally fresh and active in place of the quiet and long-standing lesions of hilus tuberculosis.

Where, then, must the indications and contra-indications be drawn in the case of apical phthisis? Forlanini tells us to *think of pneumothorax therapy as soon as ulcerative processes appear* in the lungs, and this for the following reasons: (*a*) The probability of disease remaining one-sided becomes smaller the further disease advances; (*b*) the more advanced the disease the more is the likelihood of adhesions appearing and limiting, or altogether preventing, this treatment; (*c*) the more circumscribed the disease the more assurance is there that the lung will expand and functionate perfectly after the treatment is completed; and (*d*) the more advanced the disease the greater the risk of that fatal accident, perforation of the lung. These warnings against delay are applicable, though in a different degree, to hilus tuberculosis no less than to apical phthisis, but in hilus tuberculosis it commonly happens that the extent of disease has only been realised when it is already far advanced. In apical phthisis the most important of these warnings is the first—namely, the likelihood of active disease appearing in the better lung and jeopardising, or altogether preventing, treatment by artificial pneumothorax. As a rule this will have happened before the other three warnings need to be seriously taken to heart, so that our main consideration must be the state of the other lung.

The other lung.—Most writers are of opinion that active disease in the opposite lung is a distinct contra-indication for treatment; inactive or quiet disease is considered no bar. These qualifications are obviously open to various interpretations; the decision must always be one directed to the individual case. Zink found that even arrested lesions which extended beyond the upper lobe generally got worse. Spengler regards a fresh, active process of the other side as an absolute contra-indication. Weiss, on the other hand, remarks that active lesions may sometimes be favourably influenced; he has at least seen them uninfluenced. Forlanini holds that limited active lesions may improve. He has described also two cases with double lesions too advanced to treat, but which later developed spontaneous pneumothorax. This was kept up artificially and resulted in a great improvement in both cases, proceeding in one to complete recovery. On this account he suggests that some cases with double lesion should be given the chance, and he and others have treated both lungs alternatively with some measure of success. In this country, however, pneumothorax treatment must be regarded as still on its trial, and it should on that account be reserved as far as possible for cases strictly suitable. Its use as a last resort in cases well-nigh hopeless is, at this stage of its history, greatly to be deprecated. Not only will it at times defeat its own purpose unless chosen with the greatest circumspection, and actually hurry such cases to death, but also its failure to relieve is bound to bring it into undeserved discredit and thereby deprive other suitable cases from the lasting benefits it is able to confer. Though it cannot perhaps be refused in certain cases where the chances are small, these important disqualifications should be borne in mind before consent is given to its trial.

Early phthisis.—A more important disqualification, in my opinion, exists in the case of early phthisis. The use of pneumothorax therapy in these cases can be shown on many grounds to be contra-indicated. In the first place, it is unnecessary, since early phthisis is a most curable disease by many other methods of treatment. In the second place, it is inexpedient, in that it brings with it risks and the chance of serious complications out of all relation to the benefits it can confer. Pleural shock and gas embolism can perhaps be considered but infinitesimal risks where modern knowledge is properly applied, but they cannot be altogether eliminated; the chances of pleural effusion, on the other hand, and the troublesome deformities which may follow it, cannot in any way be avoided. Such effusions occur altogether in nearly 50 per cent. of pneumothorax cases, and though the shorter treatment required for slight disease would reduce this percentage, yet effusions must occur in many, and expansion of the lung fail or be incomplete in a few. Moreover, the lung may become totally adherent and the patient be thereby deprived of this treatment at a later stage, if it should then be required.

Having considered, then, shortly the extremes which bound the limits of suitability on either hand, we may return to the recommendation of Forlanini to think of pneumothorax treatment as soon as ulcerative processes appear in the lungs. Cases of cavitation of anything but small extent, and cases where an infiltrative process progresses in spite of a fair trial of sanatorium treatment—these are the general indications in cases of apical phthisis. Here we are speaking of chronic or fibro-caseous disease; the acuter forms of tubercle need special and separate consideration.

Acute Forms of Tuberculosis.

Miliary tuberculosis does not, of course, come into consideration. The broncho-pneumonic forms are commonly so far bilateral that the question of pneumothorax therapy hardly arises. Caseous pneumonic cases are generally one-sided at first, and have received this treatment with varying success at the hands of different operators. Forlanini has not been fortunate in this class of case, but has found that disease always invades the opposite lung. Saugman, however, has had success in a case of consolidation of the whole of one lung. Dumarest also claims a cure in a case of this class. Weiss treated 5 pneumonic cases; in 4 disease appeared on the opposite side, in one case as late as six months after, and death resulted. In the fifth case, which was one of caseous pneumonia on the top of chronic phthisis, recovery occurred. I treated a broncho-pneumonic case involving the whole of one lung, and with a fair amount of active central disease on the opposite side; the patient died of a rapidly developing œdema of the better lung. I have also treated a case of caseous pneumonia with the best possible results up to the present. I give brief particulars of the case.

The patient, aged 19, had been admitted to the London Hospital on Jan. 21st, 1915, with a diagnosis of lobar pneumonia. Acute onset two weeks previously, with rigor, pains in the right chest, dyspnœa, and cough. There was consolidation of the whole of the right lung. Temperature swinging between 100° and 101·5° or 102° F., often highest in the early morning; pulse 100–112; respirations 28–32; wasting. Tubercle bacilli found in the sputum on Jan. 28th. Returned home in *status quo* Feb. 24th.

The patient was seen by me early in March, 1915. He was admitted to hospital on March 10th wasted and ill; weight 6 st. 13 lb.; temperature 99°–100°, often larger fluctuations, occasionally of reversed type; pulse, 120; respirations, 28. There was consolidation with crepitations over the whole right front and lower two-thirds back. Large cavitation at base. Left side clear, save for some crepitations outside the heart's apex and base behind.

On March 23rd an artificial pneumothorax was initiated on the right side and soon made complete with displacement of the heart one inch outside the left nipple. Intrapleural pressure was kept at + 10 to + 12 cm. H_2O mean pressure, but at a later stage reduced to + 7 or 8. The lung appeared very stiff and solid to X rays and did not collapse to the usual dimensions. The temperature was normal by April 10th, but the pulse not until the middle of May. The patient began to leave his bed on April 28th. He lost a few pounds in weight up to mid-June and afterwards gained steadily. His general health progressed steadily and by August the left side was entirely clear. He was then by mistake set to light gardening work. Tubercle bacilli began to appear and to increase in the sputum, of which there was still a trace, crepitations returned on the left side, and by Oct. 19th there were 3 inches of fluid in the right pleural cavity, rising to 5 inches in November, and afterwards remaining stationary. The fluid, examined by Dr. Roodhouse Gloyne, was of clear amber appearance; it contained 3·5 per cent. of protein, a small deposit of endothelial cells, was sterile, and contained no tubercle bacilli. No antibodies present. The patient has since remained well; up and about with normal temperature; sputum practically absent; pulse, 88–92; respiration 24. His weight on Feb. 2nd, 1916, was 7st. 10 lb. 3 oz., a gain of 11 lb. since admission. Some fluid remains in the right pleural cavity, but, as commonly happens in these cases, it causes no inconvenience and will be left to absorb. The patient has received in all 23 fillings of nitrogen in the ten months during which he has been under treatment.

N.B.—By the end of March fluid was entirely absorbed; weight 8 st. 2 lb. on leaving hospital in April. Has remained well and at work since.

Hæmoptysis.

There remains only hæmoptysis as an indication for pneumothorax treatment. This may be an emergency

operation for a bleeding otherwise uncontrollable and likely to prove fatal, or it may be undertaken for cases of recurrent hæmoptysis. I have treated a case of the latter class, but adhesions have prevented the development of a really efficient pneumothorax. Nevertheless, a relative immunity from attacks has resulted from a mere relaxation of the diseased lung. Masenti, Borgogno, and Vergano found that total collapse was not needed, nor even a positive intra-pleural pressure, to secure an arrest of the hæmorrhage. A gas quantity between 250 and 1100 c.c. sufficed to attain this result in their five cases. It is best, however, to collapse the lung fully in these cases as in others whenever adhesions do not prevent it.

Contra-indications.

Disease of other organs, whether tubercular or not, may contra-indicate the production of an artificial pneumothorax.

Lungs.—The question of the better lung *qua* tuberculosis has already received consideration. Advanced emphysema and asthma are contra-indications. Dyspnœa is in itself no contra-indication, since it is in many cases toxic in origin and is relieved by the removal of auto-inoculation.

Circulatory organs and kidneys.—Pneumothorax therapy may reduce the pulmonary vascular area, in some cases at least, and thus put a strain on the right heart. In addition, the loss or reduction of intrathoracic suction tends to embarrass the venous circulation. The effect of these disabilities on circulatory organs and kidneys renders any serious disease of these organs a contra-indication to pneumothorax therapy. On the other hand, it must be noted that certain cases of nephritis appear to be of tuberculo-toxic origin, and have been known to recover when auto-inoculation was removed.

Laryngeal tuberculosis is no contra-indication, unless very advanced, and then a doubtful one. Da Gradi has described three bad cases from Forlanini's clinic improved or healed. Slighter cases of laryngeal disease commonly improve; among 11 such cases mentioned by Zink all recovered except one very bad one, and that one improved very decidedly.

Intestinal tuberculosis is a contra-indication, unless slight and consequently latent. Brauer and Spengler, however, record two cases where intestinal disease led to symptoms, and where these disappeared under pneumothorax treatment.

Diabetes is a complication which should make the physician very chary of recommending pneumothorax treatment.

Conclusions.

At the conclusion it may be stated shortly that pneumothorax treatment should be borne in mind in all cases where life is "threatened," but it must not be postponed till life is "in danger," for it is mostly then too late. "The high function of pneumothorax therapy," says Weiss, "is this—to restore lost cases to health"; but the bad outlook must be recognised in good time if pneumothorax treatment is to succeed. A phthisis case may be to the initiated "lost," so far as ordinary methods of treatment are of avail, long before the end is in sight. It is at this stage, or even before, that the suitability of pneumothorax treatment must be decided upon if a clear other lung, absence of widespread adhesions, and a re-expansible lung are to be with any likelihood attained. On the other hand, it must be admitted that the advanced, apparently unilateral, hilus tuberculosis cases are seldom met too late for this treatment, and it is remarkable how often the pleura remains sufficiently unadherent to allow the production of an efficient pneumothorax over disease extending even from apex to base.

Queen Anne-street, W.

THE LATE MR. GEORGE VAWDREY, M.R.C.S., L.R.C.P. Edin.—A handsome iron rood screen has been placed in Phillack Church as a memorial to the late Mr. George Vawdrey.

BATH CITY COUNCIL AND THE MEDICAL OFFICER OF HEALTH.—Owing to some friction between the Bath city council and the medical officer of health (Dr. W. H. Symons), the latter received an intimation to terminate his engagement on July 17th. Nine candidates were selected to appear before the sanitary committee last week; of these five attended, but subsequently withdrew their applications. After a long discussion the council decided to continue the existing arrangements until after the war and to withdraw the notice to Dr. Symons.

A CASE OF OBLIQUE HEMIANOPIA FROM WOUND OF OPTIC CHIASMA.

BY PURVES STEWART, C.B., M.D. EDIN., F.R.C.P. LOND.,
COLONEL, A.M.S.; CONSULTING PHYSICIAN TO H.M. FORCES;
AND
A. D. GRIFFITH, B.S. LOND., F.R.C.S. ENG.,
CAPTAIN, R.A.M.C. (T.); SPECIALIST IN OPHTHALMOLOGY.

LESIONS of the chiasma without implication of the long tracts of the brain-stem occur so infrequently that we deem the following case worthy of record.

The patient, aged 24, was wounded on Jan. 5th, 1916, and came under observation a week later. He had multiple shrapnel wounds of both upper limbs and of the right lower limb. In addition, one metallic fragment had entered through the right upper eyelid, destroying the right eye and lodging within the cranium, where radiography showed it to be about a quarter of an inch above and a quarter of an inch in front of the upper limit of the sella turcica. It had crossed the mesial plane and was lying half an inch to the left of the middle line. (See Figs. 1 and 2.) When hit the patient immediately became unconscious and had a subsequent period of amnesia which lasted for several weeks throughout the attack of septic meningitis which followed. Two days after his injury, on board the hospital ship, it was noted that he was completely blind and that the pupil of the uninjured left eye was widely dilated and insensitive to light. The signs of severe meningitis rapidly increased, with headache, delirium, pyrexia, and head retraction. For the first ten days the patient seemed moribund, and minute observations on his eyes were impossible. He then began to improve and was more carefully examined on Jan. 17th—i.e., 12 days after the injury. On this day the temperature, which since admission to hospital had been swinging between 100·8° and 103·4° F., was 101·8°. The pulse, which had varied from 88 to 100, was 96. The patient was now able to reply intelligently to questions, although still at times mildly delirious. He complained of headache and cervical rigidity. The right eyeball was completely disorganised and suppurating. The left eye had no perception of light and its pupil was widely dilated and insensitive. The left optic disc and fundus were normal. In particular, there was no pallor of the disc and no suspicion of optic neuritis. The cranial nerves were otherwise normal. There was no sensory or motor paralysis of the face, trunk, or limbs. The knee-jerks and ankle-jerks were normal. The plantar reflexes were of the normal flexor type. Kernig's sign was well marked. The cerebro-spinal fluid was opaque and milky; on standing it showed a thick deposit of pus. The meningitis gradually subsided during the next six weeks under treatment by urotropine internally, together with lumbar punctures on alternate days, the cerebro-spinal fluid becoming normal.

On Jan. 29th the right eye was excised. The globe was found to be full of blood clot. There was no obvious suppuration within the orbit. On Feb. 4th—i.e., a month after the injury—it was observed that some vision had returned in the left eye, in the nasal half of the field, so that the patient could distinguish hand-movements close to the eye. On the 18th, when the meningitic symptoms had subsided and the cerebro-spinal fluid had become almost clear, the hemianopia of the left field was confirmed. From the 24th onward the temperature remained steadily normal. On March 1st the lumbar punctures were discontinued.

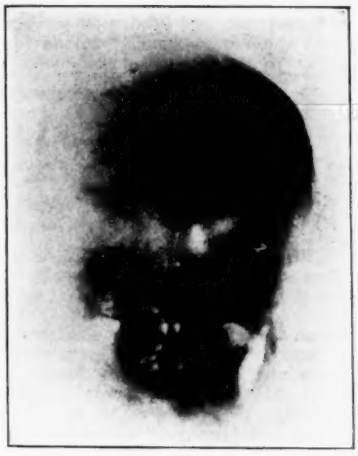
On March 9th a more careful examination of the left eye was made. The optic disc was now diffusely pale and atrophic. The left pupil was widely dilated and showed a typical hemiopic reaction—i.e., when a pencil of light was thrown on the sensitive temporal half of the retina the pupil contracted, whereas a similar pencil of light thrown on to the blind nasal half of the retina produced no reaction. The boundary between the blind and the seeing halves of the visual field was not vertical but oblique, running through the 120° meridian. (See Fig. 3.) On the 13th this obliquity of the hemianopic boundary was confirmed, and a slight gain of vision was detected in the blind half of the field, close to the fixation-point. (See Fig. 4.) On this day the vision was 1/60. By the 21st the vision had further improved to 5/60, and the visual field had also extended slightly more into the blind area, both horizontally outwards and also, in the 105° meridian, downwards and inwards (see Fig. 5) where the field had widened from the 8 circle to the 30 circle. Moreover, there was now a little vision directly downwards, and even a trace in the 75° meridian downwards and outwards. On the 23rd the pupillary reaction was no longer typically hemiopic, for now the pupil contracted to light thrown in from either side, although more briskly to light from the seeing half of the visual field.

Lesions of the visual path have been by no means uncommon during the present war; we have ourselves seen numerous examples of cortical and of subcortical lesions and of lesions of the optic radiations. Such cases present features of interest which have been studied by many observers. Lesions of the optic tract, which are commonly associated with signs of pyramidal affection from injury to the adjacent crus cerebri, are far less common; an excellent example, however, has been published by Marie and Chatelin.[1] Lesions of the chiasma itself, without implication of the long tracts of the brain-stem, are, however, still rarer.

FIG. 1.

Lateral radiogram of the head, showing a fragment of shrapnel casing lying close above the sella turcica.

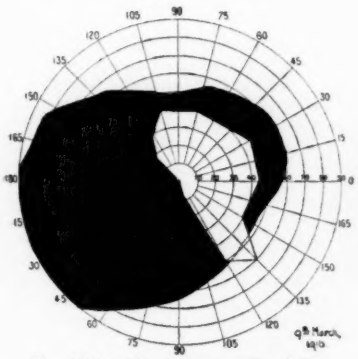
FIG. 2.



Antero-posterior radiogram of the head, showing the position of the fragment close to the mesial plane on the left.

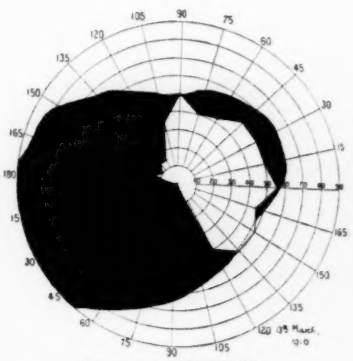
In the foregoing case the presence of an apparent left-sided hemianopia seemed at first to indicate a simple lesion of the right optic tract, somewhere behind the chiasma. The occurrence of the hemiopic pupillary reaction further limited the probable position of the lesion to a spot somewhere below the primary reflex visual centre in the right external geniculate body.

FIG. 3.



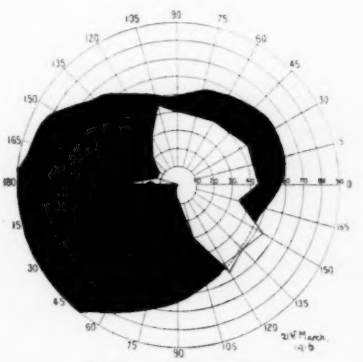
Visual field of the left eye on March 9th.

FIG. 4.



The same on March 13th.

FIG. 5.



The same on March 21st.

Further observations, however, showed that it was not so simple as this.

Let us recall, for a moment, some points in the anatomy of the visual path. The fibres from each optic nerve run backwards to the optic chiasma. Here a partial decussation occurs (see Fig. 6), so that the fibres from the right halves of both retinæ—i.e., from the left halves of both visual fields—after traversing the chiasma, emerge behind it to form the right optic tract. Similarly with the fibres from the left halves of the retinæ, which enter the left optic tract. The macular or central visual fibres from the macula lutea of each eye are distributed in both optic tracts. As the chiasma is approached the fibres from the nasal halves of the retinæ (temporal halves of the fields) tend to become ventral in position, while those from the temporal halves tend to become dorsal. The macular bundle occupies a central position. The optic tract, emerging from the chiasma behind, contains visual fibres from the whole contra-lateral half of both visual fields, including the central fixation-point of each eye. It winds backwards, around the outer side of the crus cerebri, to the primary optic centre in the external geniculate body and anterior corpus quadrigeminum. The farther backward course of the visual fibres to the cortical half-vision centre in the calcarine cortex does not concern us here.

In our case the apparent left-sided hemianopia, together with the hemiopic pupillary reaction, seemed at first sight to point to an ordinary straightforward lesion of the right optic tract. More careful study, however, showed that this was not the case. Firstly, the boundary between the blind and the seeing area of the visual field is not vertical, as in an ordinary tract lesion, but oblique. That is to say, both lateral halves of the visual field are affected, including nearly the whole of the left field and a small sector of the right. The incompleteness of the affection of the left field is further evidenced by the fact that there is also a small area of recovery extending outwards from the fixation-point.

FIG. 6.

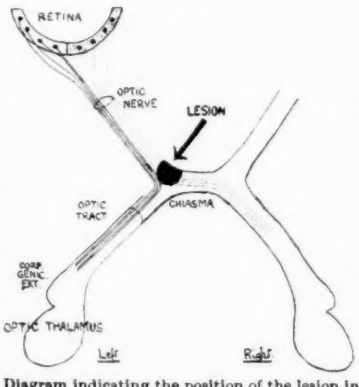


Diagram indicating the position of the lesion in the optic chiasma.

Fig. 6 is a diagram indicating the position of the lesion in this case. The lesion affects mainly the fibres destined for the *right* optic tract. Some of them, however, have escaped — viz., those corresponding to the upper and mesial sector of the blind field—also a smaller number corresponding to the area just above the horizontal plane, directly

[1] Revue Neurologique, 1915, p. 1232.

outwards from the fixation-point. These latter fibres, from their central position in nerve and chiasma, would be well protected from injury. In addition, a number of fibres destined for the *left* optic tract are also implicated—viz., those corresponding to the lower and mesial sector of the right half of the visual field.

EARLY ETHER ANALGESIA.

BY D. P. D. WILKIE, M.D., M.CH. EDIN., F.R.C.S. EDIN.,
ACTING STAFF SURGEON, R.N.V.R.

THE question of the choice of anæsthetic for minor operations is one of perennial interest, but never more so than in war time, when, in the Services, minor operations acquire a new and peculiar importance. For the class of case for which a local anæsthetic is unsuitable—e.g., in dealing with inflamed tissues, and where a very brief though painful operation is necessary—such anæsthetics as nitrous oxide and ethyl chloride are commonly employed. In hospitals the apparatus required for the administration of these anæsthetics will practically always be available. Such is not the case, however, on active service on board ship or in the field, where the medical officer must, like the general practitioner, use methods which do not involve any cumbersome apparatus. For him it remains to decide between chloroform and ether, with the disadvantages associated with full surgical anæsthesia in the case of both these drugs.

For the past few years I have used ether as the anæsthetic in such cases, but have taken advantage of the transient stage of analgesia which supervenes when ether is supplied abundantly, long before the patient could be said to be "under" in the ordinary sense of the word. I have found this method of anæsthesia exceedingly useful, as it is time-saving and perfectly free from danger.

In the text-books on anæsthetics which I have consulted I can find no reference to this method of employing ether

FIG. 1.

Materials required for inducing early ether analgesia: the Schimmelbusch mask, a measure containing 3 drachms of ether, and a hand-towel folded double.

for minor operations. The only reference I have found to this early stage of analgesia under ether is in Buxton's book on anæsthetics, where, in describing the "second stage" of anæsthesia under ether, the author states that "semi-anæsthesia exists, and pain even if slightly felt is seldom remembered as pain upon awakening." He points out that this is probably the degree of anæsthesia of which Péan wrote when he described patients who moved freely and appeared conscious, but were nevertheless oblivious to the surgeon's knife. During the war, whilst serving in the navy, I have been able to give this method a thorough test and have endeavoured to standardise its use, and now feel in a position to recommend it with confidence to the profession.

In making practical use of this transient phase of analgesia certain conditions are essential for uniform success. The ether vapour must be given concentrated from the start, and the patient must inspire regularly and fairly deeply. Neurotic and unwilling patients are therefore unsuitable.

The only apparatus required is a Schimmelbusch mask (preferably the modified form described below), also a towel and a receptacle which will hold 3 drachms of ether. The part to be operated upon having been cleansed and the operator being ready with the necessary instruments to hand, an ordinary hand-towel folded double is laid across the patient's neck and chest, the mask is placed over his nose and mouth, and the ether (3 drachms) is measured out in readiness to pour on to the mask. (Fig. 1.) The patient is warned to breathe quietly and deeply as soon as the ether is applied to the mask. At a signal from the surgeon that all is ready the whole quantity of ether (3 drachms) is poured over the mask and the folded towel brought over the face and mask and kept closely applied. (Fig. 2.) It will be found that in from 30 to 50 seconds, provided that the patient breathes regularly, the stage of analgesia has set in and will last from 50 seconds to 3 minutes, the usual duration being slightly less than 2 minutes. During this period the patient will usually remain quiet, even though inflamed parts are being forcibly dealt with, as, e.g., in removing a septic ingrowing toe-nail; occasionally he

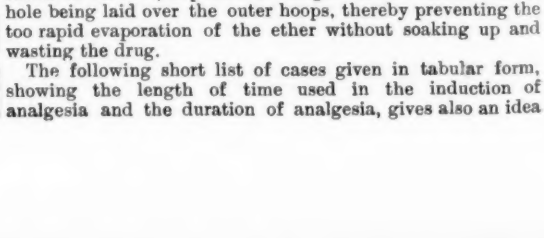
FIG. 2.

The analgesia induced: the 3 drachms of ether have been poured over the mask, the folded towel brought over and kept closely applied.

will shout, though remaining quite still. This may be disregarded, as on recovering a few moments later he will state that he has felt no pain. Within one minute of completing the operation the patient is usually awake and is always in the best of humour, the ether having acted as a pleasant stimulant. He is able to walk out of the theatre and to take a meal shortly afterwards. There appear to be no unpleasant after-effects.

In administering the ether with the ordinary Schimmelbusch mask, it was found on applying the towel over the face and mask that some of the ether was absorbed by the towel and thus partly lost. The modified mask, which has two extra folding supports to keep the towel off the lint which is soaked with ether, is a distinct advantage. (Fig. 3.) It is supplied by Messrs. Allen and Hanburys, Wigmore-street, London, W., and will be found useful for the administration

FIG. 3.



A modified Schimmelbusch mask, with two extra folding supports to keep the towel off the ether-soaked lint.

of ether by the "open" method when full surgical anæsthesia is desired, a piece of Gamgee tissue with a central hole being laid over the outer hoops, thereby preventing the too rapid evaporation of the ether without soaking up and wasting the drug.

The following short list of cases given in tabular form, showing the length of time used in the induction of analgesia and the duration of analgesia, gives also an idea

of the type of minor operation for which this form of anæsthesia is suitable.

Table showing Length of Time taken in the Induction and Duration of Analgesia.

Operation.	Time taken in induction of analgesia.	Duration of analgesia.	Remarks.
	Seconds.	Min. sec.	
Multiple abscesses of neck; incision and scraping.	35	1 45	Complete analgesia.
Removal of septic ingrowing toe-nail.	40	2 0	,,
Circumcision.	35	2 0	,,
Removal of septic ingrowing toe-nail.	70	1 30	Shouted loudly; no pain felt.
Bubo; incision and scraping.	50	1 0	Complete analgesia.
Cutting off projecting portions of two phalanges with bone forceps.	35	2 0	,,
Incision and scraping of axillary abscess.	30	1 45	,,
Removal of two septic ingrowing toe-nails.	45	2 30	,,

I am indebted to Dr. Matheson, temporary Surgeon R.N., for kindly taking the photographs.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

TWO CASES OF THORACIC ANEURYSM.

BY GEORGE J. CONFORD, M.D. OXON.

THE aortic arch is recognised as the most usual situation for the development of aneurysm, but it is somewhat remarkable to have found the same unusual cause of death in two successive post-mortem examinations, while death had taken place in an exactly similar manner in both cases.

CASE 1.—The patient was a sailor on a lightship, aged 53 years, who had not complained of feeling ill until the moment of his fatal seizure. On the evening of Dec. 26th, 1915, while at supper, he complained of sudden pain in the chest. His companions, seeing him turn very pale, gave him some brandy and laid him on a seat, but he died almost immediately. A post-mortem examination was made by the coroner's order and the following conditions were revealed. On opening the thorax the right pleural cavity was found full of clear serum and blood clot, there were no pleuritic adhesions, and the lung was moderately collapsed but otherwise normal. The aorta was enlarged, the ascending part of the arch being converted into an irregular somewhat fusiform sac, more prominent posteriorly. Rupture had occurred at the posterior part of the sac near the origin of the innominate artery, and the mediastinal connective tissue was infiltrated with tough semi-organised blood clot, showing that oozing had been going on for some little time before the final catastrophe. There is no record of any symptoms during life, and no physical examination had been made, as the man never had occasion to consult a medical practitioner for years past.

CASE 2.—The patient was a soldier aged 33 years. So far as could be ascertained he had never suffered pain or inconvenience until five days before his death, and presumably there were no abnormal physical signs, as he had recently been examined before readmission to the army. On Feb. 15th he complained of occasional difficulty in swallowing and had attended at the sick inspection room on this account. On the 20th he had been carrying a scuttle of coals, and on returning to his hut sat down on a bench and complained of sudden severe pain in his chest. He rolled over on to his back, and the medical officer was summoned, attended at once, but found him dead. An order for a post-mortem examination was given by the coroner and was made by me at the request of Dr. W. R. Etches, the regimental medical officer. The right pleural cavity was found full of serum and blood clot, as in the previous case, but the aneurysm was situated at the lower part of the transverse portion of the aortic arch, was irregularly sacculated in shape, and the walls were very thin in parts. The interior of the sac was irregularly ridged, and perforation had occurred at the periphery of a small secondary projection jutting out from the posterior part of the main sac. Blood clot had infiltrated the mediastinal connective tissue, but was apparently quite recent and less tough than in the previous case. The aneurysm must have pressed upon the trachea and œsophagus, but presumably only lightly, as the dysphagia had only been occasional, and there had never been any dyspnœa. There was no alteration in the voice or other evidence of pressure on the recurrent laryngeal nerve. There was some evidence of syphilis in this case in the form of scars, almost certainly of specific origin. In neither case was there any marked degree of cardiac hypertrophy.

The similarity of these cases in their termination, the complete absence of premonitory symptoms in the first and the slight previous evidence of illness in the second, appeared of sufficient interest for me to place them on simultaneous record.

Felixstowe.

A CASE OF PERFORATED TYPHOID ULCER OPERATION; ACUTE OBSTRUCTION; OPERATION; RECOVERY.

BY F. M. NEILD, M.B., B.S. LOND.

A SUCCESSFUL case of operation for a perforated typhoid ulcer is scarcely worth recording, if it were not for the fact that acute obstruction took place nine days after, necessitating a further operation which was also successful.

The patient, a Portuguese half-caste boy aged 10, miserable, thin, and looking half-starved, was said to have been always delicate. He had a mild attack of typhoid lasting from Jan. 25th to Feb. 9th, 1915; Widal reaction positive. After the temperature had been normal for nine days he had a severe relapse and became extremely ill. In the early morning of March 9th he was seized with severe pain in the abdomen and vomited several times. The sister (nun), however, did not send for me, and I only saw him at 10 A.M. on my usual round. The temperature was 103° F., pulse 102; the abdomen was rigid and extremely tender, while the liver dullness was absent.

Operation took place at 12.30 P.M., about eight hours after the perforation took place. A small perforation was found about 1½ feet from the ileo-cæcal valve; this was closed by a purse-string suture. There were no signs of peritonitis except for a few shreds of lymph near the perforation. A quantity of brown fluid was removed from the pelvis by dry sponging. The boy's condition was very poor, so the wound was closed with through-and-through silkworm-gut sutures, a rubber drainage-tube being left in the lower end of the wound leading down into the pelvis. The same evening he was very collapsed; temperature 96°, pulse 140 and very feeble; but he rallied with subcutaneous injections of saline and camphorated oil. There was great difficulty in getting the bowels to move, and for the first two days no flatus was passed, and then only after the passage of a long rectal tube. The drainage-tube was removed on the third day. The bowels moved naturally on the fourth day and then every day once or twice until March 18th. The stitches were removed on the 16th; owing to tension there was a good deal of sloughing and pus was oozing from the stitch holes.

When I saw him on the morning of the 18th he seemed to be in great pain and had been vomiting continuously for several hours. Temperature 97°; pulse 140, very small and feeble. The abdomen was distended, but not markedly tender. An enema produced no result and no flatus was passed after the passage of a rectal tube. Operation was decided on, but a very gloomy prognosis was given, especially on account of the condition of the external wound. The anæsthetic was ether, given by the open method. The old wound was opened up. The bulk of the small intestine was distended, but in the right iliac fossa a collapsed portion was seen, a band of omentum passing down towards this. On pulling up the bowel the obstruction was released, and gas at once passed into the collapsed intestine. The exact mechanism of the obstruction could not be seen, but it occurred at the site of the perforation. The bowel wall here was denuded of peritoneum to a small extent. This denuded area was closed over with Lembert sutures. The abdominal wound was completely closed without drainage by through-and-through stitches. The operation only lasted 15 minutes from start to finish. His condition immediately afterwards was much better than before and no further vomiting took place. Flatus was soon passed, and the bowels were moved with castor oil on the second day. The day following operation the patient was clamouring for food. There was scarcely any rise of temperature after the operation. The stitches were removed on the tenth day and recovery was uninterrupted.

Shanghai.

Reviews and Notices of Books.

Operative Midwifery.

By J. M. MUNRO KERR, M.D., C.M. Glasg., Professor of Obstetrics and Gynæcology, Glasgow University; Obstetric Physician to the Glasgow Maternity Hospital. Third edition. With 308 plates and figures in the text. London: Baillière, Tindall, and Cox. 1916. Pp. xvi. + 725. Price 25*s.* net.

THE appearance of the third edition of Professor Munro Kerr's book on "Operative Midwifery" has been delayed by the war, and five years have elapsed since the second edition was published. A good many alterations have been made in the text. Thus the author's latest results in the treatment of contracted pelves, the application of forceps, the performance of pubiotomy, Cæsarean section, and other operative procedures have been added and increase the value of the work very considerably. Five years' further experience has not led to any marked modification of the views held by the author on the many obstetric problems which he discusses, and the result is a work embodying an exceptionally large experience of difficult cases of labour and containing a great deal of sound information. It is interesting to note that the author is more and more convinced of the safety for both the mother and the child of spontaneous delivery in cases of contracted pelves, and his experience coincides with ours when he says that it is very difficult to convince other people of this fact. Professor Munro Kerr's teaching as to the use of forceps in contracted pelves is very good. By not applying the instrument until the head has been given adequate time to mould, by not applying it to the head above the brim or when there is a posterior parietal presentation, and by not continuing attempts at forceps delivery after two failures with a moderate degree of traction and the patient in Walcher's position, his results have very much improved.

The chapter dealing with pubiotomy contains a well-balanced summary of the reasons for and against this operation. That the author is not an undue advocate of the procedure is shown by the fact that while Cæsarean section has been performed 120 times in the Glasgow Maternity Hospital during the years 1900 to 1913, pubiotomy has only been practised on eight patients. The interesting suggestion made by Rotter, of Budapest, in 1912 is alluded to. He advised resection of the promontory of the sacrum in a contracted pelvis so as to produce permanent enlargement of the brim, and at the time he published his paper had practised the operation on nine patients. The statistics furnished by the author of the results of the induction of premature labour for contracted pelves show that the fœtal mortality is not unduly high when the conjugata vera measures from 3¼–3½ inches, and that with more careful selection of the cases the mortality should be still further lowered, as has happened in these series of cases. On the whole, however, Professor Munro Kerr cannot be called an enthusiastic advocate of the operation, but his opinion on the subject is the more valuable since his experience of the treatment of contracted pelves is large, and his book shows that he does not condemn any method of treatment without good reasons.

We can confidently recommend this third edition as a most trustworthy guide for the student and the practitioner.

Text-book on Nervous Diseases.

By Professor H. CURSCHMANN, of Mainz, and 14 other Contributors (German and Austrian). Authorised English edition by CHARLES W. BURR, B.S., M.D., Professor of Mental Diseases in the University of Pennsylvania. In two volumes. With 156 text illustrations. Philadelphia: P. Blakiston's Son and Co. 1915. Pp. 1132. Price $12 net the two volumes.

Professor C. W. Burr has edited an English version of a recent text-book of nervous diseases compiled by various leading German and Austrian neurologists, with Professor Curschmann, of Mainz, as its general editor. Neurology of to-day stands in intimate relation with internal medicine in general and with psychiatry in particular, but it is also linked to ophthalmology, otology, dermatology, bacteriology and serology, and surgery. As specialism increases with the sum of human knowledge, there appears to be a widely disseminated feeling that the text-book of to-day should be a compilation, a symposium, made up of individual contributions from specialists in various adjacent fields of study. There are advantages and disadvantages alike in this method. Professor Curschmann declares in his preface that he is not blindly following the fashion of the coöperative method in text-book production, but that the peculiarity of neurology forces him to include the above allied sciences, in so far as they bear on neurology, in his presentation of the subject for the non-specialist. However concise and compact the individual contributions are, a text-book of this description is apt to suffer from certain inequalities and tendencies to overlapping, and the different points of view are sometimes rather confusing to the beginner.

Taken as a whole, the volumes under review contain a thoroughly up-to-date and instructive presentation of the science of neurology. Some of the individual articles are excellent alike in matter and in style; others are valuable because they supply information not often so collected. Professor Liepmann's chapter on the normal and pathological physiology of the brain, for instance, is a particularly good *multum in parvo*. On the other hand, the article on "vasomotor and trophic diseases" is a curious conglomerate, for it includes certain diseases of the endocrine glands and omits others in an unsatisfactory fashion. The editor has evidently been embarrassed by the question of what constitutes a nervous disease and what does not. Exophthalmic goitre, myxœdema, and acromegaly are included, while the suprarenal gland is apparently taboo.

The editor of the English edition has added a chapter on the diagnosis and treatment of neurasthenia, psychasthenia, hysteria, and borderland mental states, written from a different point of view from that of the original contributors to the same subjects. The translation runs smoothly enough, but it shows evidence of different hands, and some parts—e.g., the chapter on "general diagnostics of nervous diseases"—are not up to the level of translation of the rest of the book.

Veterinary Therapeutics: A Guide to the Treatment of Disease in the Domestic Animals.

By E. WALLIS HOARE, F.R.C.V.S., Lecturer on Veterinary Hygiene, University College, Cork. Third edition. London: Baillière, Tindall, and Cox. 1916. Pp. 943. Price 18*s.* net.

THIS well-known text-book has been revised and modernised by the author. As in previous editions the subject matter is divided into three main parts. The first section contains a valuable account of the care, management, and nursing of sick animals. The difficulties with which practising veterinary surgeons have to deal are legion and often imperfectly understood by owners and attendants, who may obtain from these pages an intelligent understanding of the carrying out of hygienic and dietetic measures among ailing animal patients. In the care, management, and nursing of cattle, dogs, cats, and birds, stress is laid on the fact that drugs only aid the power of recovery; they do not ensure it, hence routine and repeated drugging is condemned. Other matters discussed in this section are the diagnosis and general symptoms of disease, the actions and uses of drugs, and the administration of medicines. Part II. deals with materia medica, avoiding elaborate detail of manufacture, and giving the knowledge necessary to the student and practitioner for the application of the remedies to disease. Where the employment of one salt of an element is more advantageous than another the fact is noted and the reason given. The list of preparations is very complete, comprising both modern as well as older and well-tried remedies. A chapter is devoted to the various vaccines and serums used in veterinary practice. Part III. is taken up with the special therapeutics of various diseases, and includes chapters on the care, management, and nursing of sick sheep and pigs. A feature of the book is the account given of the actions of drugs as obtained from animal experiment.

In the production of his book the author has had the coöperation of Messrs. H. Begg, F.R.C.V.S., G. Mayall, M.R.C.V.S., W. M. Scott, F.R.C.V.S., and H. Gray, M.R.C.V.S. It marks a distinct advance on anything yet published in this special sphere, is well arranged, and carefully indexed.

LIBRARY TABLE.

A New Treatment for Gonorrhœa. By CHARLES RUSS, M.B. Lond. London: H. K. Lewis and Co. Pp. 38. Price 3*s.* net.—In this small work the author describes a system of treatment applied by him in recent years to the cure of gonorrhœa. It is founded on experimental studies of the effects resulting from the passage of a constant electric current on bacteria immersed in fluid. It is claimed that the current causes the bacteria to accumulate gradually at the positive electrode and to bring about the death of the organisms in a short space of time. The method consists in passing a platinised catheter down to the compressor urethræ. This catheter has numerous perforations and is furnished with a stylet of platinum wire which just enters the meatus. A lint-covered pad with a metallic core, soaked in warm saline, is placed on the perineum and a 2 per cent. solution of sodium iodide is injected into the catheter. The pad is then connected with the negative and the stylet within the catheter to the positive pole of the battery. At the end of each treatment the perforations in the catheter are filled with masses of muco-pus, which on microscopic examination are found to be swarming with killed gonococci. The author claims that in this way a simple and limited attack of gonorrhœa can be cured in from 10 to 20 administrations and that complications are extremely rare. This treatment has had no wide application at present, and experience alone can decide as to its efficacy. It has not been found very successful for suppuration in general, and it would seem improbable that the electro-chemical reactions could penetrate into all the lacunæ and glands of the urethra without causing damage of tissues.

Pye's Surgical Handicraft: A Manual of Surgical Manipulations, Minor Surgery, and Other Matters connected with the Work of House Surgeons and Surgical Dressers. Edited and largely rewritten by W. H. CLAYTON-GREENE, B.A., M.B., B.C. Camb., F.R.C.S. Eng., Surgeon to St. Mary's Hospital. Seventh edition, fully revised. Bristol: John Wright and Sons, Limited; London: Simpkin, Marshall, Hamilton, Kent, and Co., Limited. 1916. Pp. 614. Price 15*s.* net.—A new edition of this well-known work is especially timely just now when the house surgeons and surgical dressers, for whom it is primarily intended, are working with less help from senior and experienced officers than was the case in more fortunate times. The book remains a safe guide for them and a useful work of reference also for the practitioner whose memory may now and then fail him on a point of minor surgery or the application of a contrivance. Some sections have been revised and some rewritten, and the book has been made more complete by the inclusion of a useful and well-illustrated chapter on the use of X rays from the pen of Dr. Harrison Orton. In its newest form "Pye" will continue to enjoy popularity.

The Drink Problem of To-day in its Medico-Psychological Aspects. Edited by T. N. KELYNACK, M.D.Vict., Honorary Secretary of the Society for the Study of Inebriety; Editor of the *British Journal of Inebriety.* London: Methuen and Co. 1916. Pp. 316. Price 7*s.* 6*d.* net.—This book is a revised and enlarged edition of "The Drink Problem," a collection of essays on the various biological and sociological aspects of alcoholism which was published in "Methuen's New Library of Medicine" in 1907. In the production of the present volume the editor, Dr. T. N. Kelynack, has had the assistance of most of the experts who collaborated with him in the earlier publication, and he has also secured several additional contributions of value from other writers qualified by their special knowledge and experience to speak with authority on particular aspects of this complex question. Amongst these new chapters may be indicated an admirable essay on Alcohol and War, by Sir A. Pearce Gould; a vigorous if somewhat controversial discussion of the principles of temperance legislation, by Sir T. P. Whittaker; a clear and concise review of the medico-legal relations of alcoholism, by Sir W. J. Collins; and a very interesting survey of the history of opinion with reference to the alcohol question, by Mr. J. Turner Rae. By the inclusion of this fresh matter, and as a result of the very extensive revision of the older chapters, most of which have been practically rewritten, the book has acquired many of the characters of a new work. With such a multiplicity of contributors—each of the 15 chapters is from a different hand—it is obviously difficult to maintain a unity of outlook and a uniformly high level of quality; but, on the whole, the work is very little open to criticism with respect to either of these points. And it also shows singularly little evidence of the defects of omission and overlapping which are so frequently incidental to the method of collaboration. Most of the contributors hold strong temperance views, and this fact has in a few instances led to a slightly over-emphatic presentation of the possible dangers of alcohol. But such lapses are very rare and are confined to a few chapters. The work as a whole is written in an eminently fair and temperate spirit, and with a regard for the scientific canons of evidence which is not always a conspicuous feature of the literature of the subject. The circumstances of the moment have brought the problem of alcoholism into special prominence, and it is a matter of urgent importance that public opinion should be educated to appreciate the fundamental factors of that problem and to understand the principles of which account must be taken in efforts to arrive at its solution. This volume is well fitted to assist in such an educational process, and we trust that it will be as widely read as its merits deserve. It should be added that the value of the work has been very much enhanced by an extremely full and admirably arranged index.

Practical Cystoscopy and the Diagnosis of Surgical Diseases of the Kidney and Urinary Bladder. By PAUL M. PILCHER, A.M., M.D., Consulting Surgeon to the Eastern Long Island Hospital. Second edition, thoroughly revised. With 299 illustrations, 29 being in colours. London and Philadelphia: W. B. Saunders Company. Pp. 398. Price 25*s.* net.—Only a few years have elapsed since the student of urinary surgery was in a position to complain of the want of text-books dealing with the cystoscopic examination of the bladder. That reproach to surgical authorship has certainly been removed, for now there are several works dealing with this subject and one of the best of these is the volume before us. In his second edition Dr. Pilcher has maintained the high level which he reached in the first. There are many alterations, but the main change has been in the recognition of the great importance of pyelography, and to this method of diagnosis a new section has been devoted; the technique is clearly described and the value of the indications afforded by cystoscopy is discussed in an unbiassed manner. Several excellent "pyelograms" are also given. Altogether we can commend this text-book.

Emergency Surgery. By JOHN W. SLUSS, A.M., M.D., Associate Professor of Surgery, Indiana University School of Medicine; ex-Superintendent of the Indianapolis City Hospital. Third edition, revised and enlarged. With 685 illustrations, some of which are printed in colours. London: William Heinemann (Rebman, Limited). Pp. 832. Price 17*s.* 6*d.* net.—This edition maintains the excellence of the earlier issues and the additions made by the author have brought it up to the level of the recent advances of surgery. Especial attention has been devoted to the subject of fractures, and the author has entirely rewritten the chapter on military surgery to make it accord with the lessons learned in the present war. The book has been written for the benefit of the general practitioner, and though many operations are described in it which the practitioner would not undertake in ordinary circumstances, yet in emergencies it is difficult to limit what he may have to do. It is wise, therefore, to include too much rather than to omit anything which might be needed. The book is well and clearly written; many of the illustrations are original, and those which have been borrowed from other sources have been chosen wisely.

JOURNALS.

Physiological Abstracts. Vol. I., Nos. 1–4. London: H. K. Lewis and Co. Published monthly. Annual subscription 25*s.*, post free.—Earlier in the year we announced the impending publication of a new journal with the above title, which is a venture of the Physiological Society of Great Britain and Ireland, with the coöperation of the American Physiological Society and of other societies and savants in eight countries. Four monthly numbers have now appeared, the latest of which for July contains 224 separate abstracts, and we take this opportunity of congratulating the editor (Professor W. D. Halliburton) and his staff of abstractors on the excellent character of the periodical and of commending it to all those who are interested in the advances being made in physiology and its sister sciences. The war has considerably curtailed research work in European countries, and we note that America just now takes the lead in the number of papers published. Representative physiologists of allied and

neutral countries are collaborating in this work of replacing similar periodicals which have hitherto been published in Germany, and we note with pleasure how prompt has been the work of the abstractors; in this feature the new publication compares very favourably with its German predecessors. We anticipate a brilliant future for *Physiological Abstracts* and wish it every success.

New Inventions.

A NEW MECHANICAL STAGE.

IN addition to the usual advantages of a mechanical stage, the invention here illustrated is easily fixed to, and unfixed from, any microscope. This is effected very simply. To the right on the under side of the machine is a strong curved leaf spring, attached at its proximal end to a firm crossbar; on the left at a convenient distance are pivoted

two spring fingers. The machine is slipped over the anterior edge of the stage; the curved spring firmly presses the right edge of the stage, while the two spring fingers grip its left edge and under surface This construction is sufficient to hold the machine immovably upon the stage, and is adapted to engage stages of different widths within the limits of stage sizes usually employed with microscopes.

The Medical Supply Association, 167-185, Gray's Inn-road, W.C., are the manufacturers.

Manor Park. K. HEANLEY, L.S.A.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

THE returns in some instances have not been forthcoming, a number of stations having discontinued making observations owing to the reduction of staff. It is hoped that the omissions due to this cause will be made good when normal times return. The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION:

Summary of Reports for the Months ending February and March, 1916.

Place.	Rainfall in milli-metres.	Metric tons of deposit per square kilometre during month.								
		Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.		
		Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
Month ending Feb. 29th, 1916.										
ENGLAND—										
Bolton	121	0·03	1·50	3·96	3·40	6·30	15·19	2·91	2·24	0·10
Exeter	137	0·03	2·25	2·61	1·64	5·09	11·61	1·56	0·88	0·04
Kingston-upon-Hull	75	0·11	2·24	3·23	3·28	5·03	13·89	2·37	1·09	0·07
Leicester	114	0·40	7·00	7·72	3·92	6·39	25·43	2·86	0·61	0·24
London—										
Meteorological Office	69	0·15	3·64	5·33	3·33	2·21	14·66	1·88	1·34	0·06
Embankment Gardens*	—	—	—	—	—	—	—	—	—	—
Finsbury Park	68	0·13	1·35	4·24	2·02	3·47	11·21	1·81	0·57	0·06
Ravenscourt Park	75	0·17	3·27	7·62	1·38	3·63	16·07	1·91	0·18	0·11
Southwark Park	73	0·35	4·83	11·28	3·48	5·32	25·26	2·34	1·05	0·08
Wandsworth Common	75	0·23	2·41	6·97	0·59	4·61	14·81	2·26	0·90	0·06
Victoria Park	73	0·06	0·95	4·59	2·18	5·48	13·25	2·19	0·92	0·07
Golden Lane	79	0·09	3·50	4·87	2·52	5·36	16·34	2·71	1·04	0·25
Malvern	85	—	0·08	0·20	0·52	0·82	1·62	0·41	0 25	—
Manchester—										
Queen's Park	74	—	—	—	—	—	19·97	—	—	—
School of Technology	99	—	—	—	—	—	31·15	—	—	—
Newcastle-on-Tyne	68	0·35	4·25	6·52	2·97	5·53	19·62	2·38	0·96	0·13
Rochdale	—	—	—	—	—	—	45·10	—	—	—
York	42	0·11	1·24	2·26	2·24	3·24	9·09	1·54	0·83	0·07
SCOTLAND—										
Coatbridge	71	0·07	1·85	3·54	1·98	5.09	12·53	1·81	1·07	0·09
Greenock	146	0·19	1·96	2·89	3·36	6·72	15·12	2·37	2·55	0·18
Leith*	—	—	—	—	—	—	—	—	—	—
Month ending March 31st, 1916.										
ENGLAND—										
Exeter	106	0·02	1·48	2·30	1·61	2·88	8·29	1·44	0·58	0·03
Leicester	121	0·30	6·86	7·99	3·41	6·96	25·53	3·25	0·82	0·56
London—										
Meteorological Office	96	0·13	4·36	8·95	3·84	7·68	24·96	2·63	0·13	0·04
Embankment Gardens*	—	—	—	—	—	—	—	—	—	—
Finsbury Park	78	0·15	2·18	2·31	2·34	3·54	10·52	1·93	0·91	0·09
Ravenscourt Park	101	0·16	3·58	5·85	3·84	10·66	24·08	5·83	1·25	0·14
Southwark Park	83	0·14	5·29	9·08	6·55	13·54	34·57	6·08	0·96	0·18
Wandsworth Common	39	0·02	0·47	1·48	1·20	2·52	5·70	0·93	0·69	0·16
Victoria Park	64	0·06	1·68	7·04	3·94	7·12	19·84	4·32	0·84	0·09
Golden Lane	104	0·07	3·83	5·36	4·15	6·65	20·06	3·78	1·22	0·35
Malvern	44	0·01	0·12	0·23	0·72	0·96	2·03	0·53	0·14	0·04
Manchester—										
Queen's Park	49	—	—	—	—	—	22·59	—	—	—
School of Technology	44	—	—	—	—	—	15·16	—	—	—
Newcastle-on-Tyne	86	0·37	3·93	7·25	2·40	5·65	19·60	2·61	1·52	0·18
Rochdale	—	—	—	—	—	—	25·10	—	—	—
York	68	0·18	1·65	2·93	3·24	2·43	10·43	1·73	0·81	0·09
SCOTLAND—										
Coatbridge	41	0·08	0·97	1·97	1·91	3·73	8·66	2·00	0·32	0·10
Greenock	48	0·23	2·59	5·26	1·79	4·00	13·88	2·02	0·53	0·19
Leith	47	0·06	0·92	2·74	2·82	4·70	11·24	2·35	1·10	0·09

* Samples lost.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall.

THE LANCET.

LONDON: SATURDAY, JULY 15, 1916.

The Food of the Prisoners at Ruhleben Camp.

FURTHER correspondence between Sir EDWARD GREY and the American Ambassador respecting the conditions of diet and nutrition in the internment camp at Ruhleben has been published, and contains two reports by Dr. A. E. TAYLOR to the American Embassy at Berlin. In the first of these, dated May 24th, Dr. TAYLOR states that since his last report a sharp reduction has been made in the amount of foodstuff allotted to the camp, the civilian prisoners at Ruhleben only receiving half the allowance of potatoes and little more than a third of the protein foods allotted to military prisoners of war in other camps. In the second report, dated June 14th, a more detailed analysis of the diet is given. The ration established for military prisoners of war in Germany in the month of June contained 2700 calories a day, made up of 80 grammes of protein, 29 of fat, and 500 of carbohydrate. This, though not plentiful, is an adequate diet as regards its calorie value for average men not doing much muscular work. It contains about a hundred calories more than the peace ration of the German soldier. The proportion of protein is low, but is just enough to maintain nitrogenous equilibrium with a sedentary life. The proportion of fat is very low; indeed, no fat is given except that which is inseparable from the articles of food supplied. For growing children such a low fat ration would be harmful, but it need not endanger nutrition in adults provided the requisite food value is made up by other foodstuffs, in this case carbohydrate. The diet for military prisoners of war, therefore, though poverty-stricken as regards its protein and fat, is theoretically enough to maintain nutrition if it is supplied in a form that can be digested and assimilated, a matter upon which we have ground for doubt.

The diet supplied to the civilian prisoners at Ruhleben admits of no such defence. It contained originally only 1580 calories a head, more than a thousand calories less than that for military prisoners. This is wholly insufficient. Its heat value, 23 calories per kilogramme for a man of 11 stone, is barely enough to keep him nourished, even if it were in a most assimilable form, such as milk and eggs, and he were resting entirely in bed. With the conditions of camp life and German camp food it would be starvation. As, however, many prisoners ate little or none of the camp ration, having food supplies of their own, more was left for the others, so that the actual calorie value received by each man living on the camp food was brought up to a sufficient figure—namely, 2725 calories, containing 98 grammes of protein. But with the further recent reductions this compensation fails, for in the week May 4th–11th only 1220 calories a day were supplied, with 39 grammes of protein and 6 of fat. Such a diet, both as regards its heat value and its constituent foodstuffs, is wholly inadequate. If doubled it would be barely sufficient. Even when the food not eaten by more fortunate prisoners is added, it appears that a civilian in Ruhleben living on the camp food—and there were 2070 such—could only get 1930 calories a day, with 55 grammes of protein and 10 of fat. This might prevent starvation if it were in a suitable form, but it is not. Fat, sugar, and vegetables are not supplied. Further deductions must, therefore, be made for food which is unpalatable or not digestible. It is, indeed, too clear that a large number of the interned civilians are not getting enough to eat.

In the following table the Ruhleben diets are compared with ordinary standards of living:—

	Calories.	Protein.	Fat.	Carbohydrate.
English labourer	3655	184	71	570
German farm labourer (Ranke)	4696	143	108	788
Standard diet for a man of moderate activity	2820	100	100	360
Military prisoners of war in Germany	2700	80	29	500
Ruhleben diet before reduction	1580	59	12	308
Diet actually taken when increased by food left by other prisoners receiving supplies	2725	98	24	523
Ruhleben diet since reduction	*1220*	*39*	*6*	*255*
Reduced diet when increased by food left by others ...	*1930*	*55*	*10*	*410*

If anyone has lulled himself with the reflection that the most urgent needs of the interned were met by parcels from home he will learn from Dr. TAYLOR'S report that many of the agencies sending food into Ruhleben, of which 23 are scheduled, are unsatisfactory. Some of them are doing very little, some are irregular, and others are not properly organised. More care is needed in the selection and packing of food. Parcels are sometimes as long as five weeks on the way, during which time much of the food has gone bad, especially the bread. The quality of the bread ordered from Switzerland has also deteriorated. Bread will keep if properly made and packed, for it is reported that loaves from the Army and Navy Stores and from John Barker and Co. arrive in good condition. It is to be hoped that in future all agencies sending food will work with the Prisoners of War Help Committee which has been set up by our Government to coördinate their efforts. Pending the result of protests and negotiations through the American Embassy, Sir EDWARD GREY is endeavouring to arrange for a supply of food to be sent to the captain of the camp, pointing out at the same time that His Majesty's Government in no way admit their liability to feed prisoners in Germany, which is the recognised duty of the captor Government.

The Factory Department in Time of War.

THE annual report of the Chief Inspector of Factories and Workshops for the year 1915, issued last week, is of special interest since it deals with the circumstances which have arisen in connexion with the war. The document bears eloquent tribute to the wonderful spirit which the industrial population of the nation has shown in our hour of need. In spite of the bitter strain thrown upon the workers there is no evidence of any marked increase in the sickness-rates, and the inspectors are able to show that there has been an almost entire absence of complaints that operatives are being taxed beyond their strength. There can be little doubt, as Sir ARTHUR WHITELEGGE observes, that the high wages, and the better food which workers have been able to enjoy in consequence, have done much to counteract the stress of long hours and to bring about this result. Cases of fatigue, as might well be expected, have occurred, but by adopting a policy of temporary relief in such cases there is usually full recovery of energy again. They occur commonly where overtime has been continued for long and uninterrupted periods. In certain cotton mills, however, periodical medical examination of the workers has been made a condition of a continuance of overtime, and power is given to the examining surgeon, by consent, to suspend, either wholly or for a period, anyone showing signs of fatigue. This has proved to be a satisfactory safeguard, and workers thus suspended are reported to recuperate rapidly so as to be quite fit to resume their task again.

It will be understood that in order to deal with this vast call upon the resources, energies, and materials of the country an extension of the powers exercised in the Factory Acts had in many instances to be made. The work in war time is controlled by a General Order from the Home Office, providing rules in regard to overtime and work involving day and night shifts. This Order appears to have satisfied the needs in most cases, but for others special Orders have been required, and more particularly for the large munition firms, in some of which the hours have remained in advance of those permitted by the General Order. Sunday labour, it is reported, has been found to be more and more unsatisfactory, and there appear to be economic as well as health reasons for excluding this from the category of a work-day, employers having accepted the recommendations of the Health of Munition Workers Committee to this effect. The plan advised was to arrange the work so that there should not be more than 12 shifts per fortnight or 24 where double shifts are worked, and where three 8-hour shifts are worked not less than two should be omitted on Sunday. It is preferable to work a moderate amount of overtime during the week, allowing a break on Sunday, rather than work continuously from day to day, and it is still more strongly the view of the Chief Inspector that where overtime is worked in the week Sunday labour is not desirable.

One of the most striking facts disclosed in this report is the remarkable adaptability that women have shown in taking up the duties which hitherto have been assigned to men. Sir ARTHUR WHITELEGGE sets out no less than 28 branches of industry in which men have been completely replaced by women, who are now to be found in the distillery, the chemical factory, jute mills, saw mills, printing works, wood-working factories, flour mills, soap works, foundries, and so forth. Shortage of labour, in fact, has for the most part been compensated for by the introduction of women, and there still appears to be an ample supply. The majority attracted by the high rate of wages and by the feeling that they are thus taking an active share in the war have found places in the munition works.

The question of the employment of women is further developed by Miss ANDERSON, the principal lady inspector of factories, in a special report dealing with the effect of the second year of war on the industrial employment of women and girls. She finds the 12-hour night shift for any length of time to be unthinkable for women except in extreme war emergencies, and then only if compensation in the shape of good food and general comforts is forthcoming. A very long night-shift she would watch with suspicion, and would limit it to short periods for urgent necessities. But the same story is told, in Miss ANDERSON'S report, of the women's splendid spirit in working. Attention is very properly called to the pernicious effect of long hours on adolescent hands, who quickly develop symptoms of exhaustion and impaired vitality, but the facts have to be found out for them, as for the most part their idea is to keep on working. One of the girl hands said to the inspector, "It is the good cause that gives the good heart for work," and so some of the weaker in flesh, because of their willing spirit, exceed their physical capacity in bearing their share in the war's burdens. We can well understand how arduous has become the task of the Home Department in watching over the health interests of the great band of workers which has so suddenly been placed under the sheltering care of the provisions of the Factory Acts, and the administration may be congratulated on the admirable way it has adapted its machinery to deal with a situation so different from normal times, and which has presented so many new problems of extraordinary magnitude and difficulty.

SEXUAL ENLIGHTENMENT IN SECONDARY SCHOOLS.—At a meeting of headmistresses held at the Royal Society of Medicine on July 7th, called to consider the recommendations of the Royal Commission on Venereal Diseases in reference to the education of young people in sexual physiology and hygiene, Mrs. Scharlieb, M.D., pointed out that the question of combating venereal diseases was pre-eminently a women's question, and dwelt on the rôle which the mistresses of secondary schools might play in the enlightenment of their pupils. A general request for further instruction was expressed, and it was arranged for lectures to be given at the Royal Society of Medicine on Sept. 6th, 7th, and 8th, at 8 P.M., to which all women teachers are invited.

Annotations.

"Ne quid nimis."

THE PUBLIC HEALTH CONDITION OF THE COUNTRY.

WE publish in our Parliamentary report the statement made on Tuesday night in the House of Commons by Mr. Long, the President of the Local Government Board, reviewing the work of his department, and it is with no small satisfaction that we record the broad message of that statement—namely, that the general condition of the country has never been more satisfactory. It is not only that pauperism has nearly vanished and that unemployment does not exist, but there has been a steady decrease in enteric fever and a high average standard of health, although enormous numbers of men have been suddenly collected in areas where, in the first instance at any rate, accommodation was necessarily of a makeshift nature. Mr. Long said that, in spite of the shortage of medical men as a consequence of the war, the work of his department in the prevention and treatment of tuberculosis had not been allowed to fall into arrear, while child welfare schemes had been encouraged, and a grant had been made for the payment of health visitors in connexion with designs for safeguarding the health of expectant and nursing mothers and of infants. Lastly, Mr. Long said that the Local Government Board had been able to adopt in large measure the recommendations contained in the report of the Royal Commission on Venereal Diseases; he spoke with confidence of the prospects of the coöperation between the Government, local and hospital authorities, medical men, ministers of religion, and the people generally, in the work of eradicating the evil.

STOCK MIXTURES UNDER THE INSURANCE ACTS.

BEING authorised to do so under the new scale of dispensing fees set out in the 1916 Drug Tariff, the London Panel Committee has selected four stock mixtures from the "Central List," and any of these may be ordered for their insured patients by practitioners on the London panel one calendar month after the notice given by the Panel Committee of its selection. These will be dispensed at a reduced dispensary fee of 2·3*d*., and to secure the reduction the letters C.L. should be added after the name of the mixture. The mixtures in question have been placed on the list after consideration of their capability of being stocked in bulk without deterioration, and the formulæ are commended to practitioners as a probable means of slightly reducing the cost of their drug bills and of facilitating their clerical work. The question of economy in prescribing, of which the free use of stock mixtures forms only a part, is one of the principal difficulties which beset practitioners under the Insurance Acts. Many doctors have been surcharged for extravagance in the medicines ordered by them for their panel patients, and some of these were, no doubt, not so careful as they should have been in what is in effect authorising the expenditure of public money. On the other hand, it can hardly have been the intention of those who were responsible for the scheme of National Insurance now in force that a medical man, keeping his mental eye upon a prospective bill for medicines, should prescribe for an insured patient as he would not do for one, not much better off financially, attended by him in his private practice. This, however, is what he must do, at least sometimes, if he would keep the average of his prescriptions low enough to avoid a surcharge. A medical man who has recently discussed this issue with the Secretary of the London Panel Committee has sent us a copy of his reply to an accusation of extravagance. In this it is pointed out with justice that a higher average cost of prescriptions may be a direct result of the greater individual care given to patients by a conscientious panel practitioner, and will in such a case be far more than compensated by a corresponding saving to the Sickness Benefit funds. It is not a question of considerately saving the pocket of a poor patient in a way which would not be necessary if he belonged to the affluent classes, but of bearing in mind the calls which the illnesses of other patients are making on the drug fund, and of sparing drugs accordingly. It is not right that such parsimony should be necessary. It is a parsimony not seriously affected by an infinitesimal saving in a dispensing fee here and there, but one which may affect the health of a patient, and militate against his speedy recovery. Incidentally we note a suggestion for economy in prescribing in an article contributed to the *Scotsman*, which recommends that elements introduced into a prescription purely as carminatives or for the purpose of flavouring and rendering the medicine less unpleasant should be omitted. The writer expresses the opinion that the abolition of such ingredients would probably effect a saving amounting to almost 10 per cent. of the expenditure on drugs. As to how far this estimate may be correct we express no opinion, but the economy would in most instances be a legitimate one, and, further, might tend to prevent some persons from seeking medicine who would not greatly lose thereby. The saving effected would, however, only serve to lessen the strain upon the drug fund. It would have no effect in enabling the insured patient to be treated upon the same footing as his wealthier neighbour. In fact, it would rather tend to accentuate the difference between them.

THE LIFE-CYCLE OF THE SCHISTOSOME WORMS.

DURING the past three years a considerable amount of time and work has been devoted to the life-history of the schistosome worms parasitic in man. The first workers to obtain definite results were two Japanese observers, Miyairi and Suzuki, who, in a series of observations and experiments, not only succeeded in tracing the whole of the life-history of *Schistosomum japonicum* (the causative agent in Asiatic schistosomiasis) in the intermediate host, *Katayama nosophora* (a small mollusc with seven to nine spirals, very common in parts of Japan), but also in demonstrating its mode of entry into the definitive host. The observations recorded by these workers were confirmed by Leiper and Atkinson in 1914. In the early part of 1915 the War Office Bilharzia Mission (of which Dr. R. T. Leiper, of the London School of Tropical Medicine, was in charge) proceeded to Egypt, and there succeeded in working out the life-histories of those schistosome worms which produce vesical and rectal bilharziasis respectively. Three parts of the report of the

Bilharzia Mission have already been published in the July, August, and September (1915) issues of the *Royal Army Medical Corps Journal*, and the results obtained are briefly stated in the following account. When infected material containing the eggs of the bilharzia worms is passed into water the miracidia contained within them soon make their escape. In the water they swim about rapidly, by means of the cilia with which their cuticle is furnished, and eventually are attracted to one or other of the molluscs which is to function as their intermediate host for the ensuing period of their development. The cuticle of the mollusc is pierced with the aid of the small proboscis which protrudes from the anterior extremity of the miracidium, and having gained an entry the invader finds its way to the liver of its host. In the liver a series of changes take place in the form of the miracidium, and ultimately a complete metamorphosis results in the formation of the sporocyst. This latter is totally unlike the miracidium from which it arose, and is best described as a long, hollow, thin-walled tube, which is unprovided with gut, glands, or suckers. The sporocyst is, however, capable, by a process of internal budding, of producing other sporocysts within itself. These latter, by simple rupture of the containing maternal wall, become free within the liver substance of their host, and it is in them that the next stage of the life-cycle is evolved. In this second generation of sporocysts—the "daughter-sporocysts"—internal budding again takes place. The development of these buds results in the formation of the cercariæ—the final stage of evolution in the molluscan host. The cercariæ are described as being possessed of a body and a tail, the latter being bifurcated at its extremity. The body is provided with two suckers, an oral and a ventral, and a bifurcated gut. No pharynx or eye-spots are present. Between the bifurcations of the gut are several large glandular cells which communicate with the oral sucker by means of filiform ducts. The cercariæ leave the sporocyst by rupture of the over-distended maternal wall; and, after a shorter or longer period, are expelled from the body of the mollusc into the water, there to act as the infecting agents. The subsequent course of the life-cycle was worked out by means of the experimental infection of rats, mice, guinea-pigs, and monkeys, and it was demonstrated that two modes of infection are possible—viz., the cutaneous and the oral. It would appear, from the account given in the report, that the oral route is only different from the cutaneous in that whilst in the latter case the cercariæ perforate the skin, in the former they perforate the buccal mucosa. In the case of a newly born mouse which had been immersed for half an hour in water which contained numerous cercariæ, it was found when sections of the skin were examined that many of the cercariæ had already perforated deeply into the skin, whilst in the water numerous detached tails were left. Three of four monkeys were subjected to infection with the bilharzia cercariæ by pouring into the bottom of the cages in which they were confined water which had previously been infected. The fourth monkey was given infected water to drink. All four monkeys eventually died, and were found upon examination to be heavily infected. The monkey infected with drinking water showed earlier and more intense symptoms than the others. Leiper has been able to differentiate between the adult worms, which produce the terminal-spined and lateral-spined ova, on morphological grounds. He states that the molluscan intermediate hosts are also specific—in the case of *S. hæmatobium* being two species of *Bullinus* (*B. contortus* and *B. dybowski*), and, in the case of *S. mansoni*, *Planorbis boissyi*. Dr. F. G. Cawston reports in a letter appearing elsewhere in this issue that he has been successful in determining the intermediate host for the worm producing vesical bilharziasis in Natal.

THE SALE OF MEDICATED WINES.

WE have received from the Central Control Board (Liquor Traffic) a copy of the General Order relating to the sale of medicated wines which comes into force on and after August 7th, 1916, in all areas to which the Defence of the Realm (Liquor Control) Regulations (1915) are applied. The Order provides that—

> No person shall either by himself or by any servant or agent sell or supply to any person in any licensed premises for consumption off the premises or despatch therefrom any intoxicating liquor in the form of or prepared as (*a*) medicated wine or (*b*) any mixture or preparation which contains any drug or medicament or is sold or advertised for sale as containing or purporting to contain medicinal properties, except in a bottle or other vessel bearing a label correctly stating in clear and legible words or figures the amount of proof spirit contained in such medicated wine or mixture or preparation.

This Order is not intended to affect the sale of (1) any medicine, mixture, or preparation appearing in the British Pharmacopœia or the British Pharmaceutical Codex; or (2) any medicine, mixture, or preparation which is made up for a customer on the signed prescription of a medical practitioner; or (3) medicated or methylated spirits, or spirits made up in medicine and sold by medical practitioners or chemists or druggists. The chief object of this Order is, of course, to inform or perhaps warn the consumer that these wines in so many cases are potent alcoholic liquors. We should have thought that the disclosure of alcoholic strength in terms of actual alcohol would to most people have been more intelligible than in terms of proof spirit. It is not widely known that proof spirit means alcohol diluted practically a half with water, so that the figures for proof spirit would be double those for alcohol and the statement might well convey an exaggerated idea of alcoholic strength.

VENEREAL DISEASE IN SWEDEN.

IN a paper by Dr. Sederholm on venereal disease, on which we have already commented in THE LANCET of June 17th, an interesting account is given of the distribution of venereal disease in town and country in Sweden. It is a matter of common knowledge that the venereal diseases are mainly the products of large towns and industrial centres with a dense population. But hitherto there have not been many investigations showing how great the difference is between the incidence of venereal disease in town and country. When a modified form of compulsory notification of venereal disease was introduced in Sweden on Dec. 30th, 1911, this difference soon became evident. This system of notification did not supply the names of the persons concerned, but it did give the name of the place in which infection was supposed to have occurred. The figures for 1914 show that in Stockholm the incidence of new cases of venereal disease was 2·17 per cent. of the total population. The incidence of the disease for the three towns Stockholm, Gothenburg, and Malmö was 1·49 per cent. For the smaller towns it was 0·26 per cent., and for the country districts it was

as low as 0·02 per cent. In the three large towns there were 1629 new cases of syphilis, 8168 new cases of gonorrhœa, and 1126 new cases of ulcus molle. While the total population of the three towns was only 665,638, the total population of the country districts was 4,156,717. Yet in the country districts there were only 121 new cases of syphilis, 666 new cases of gonorrhœa, and only 26 new cases of ulcus molle. It appears from these figures that the danger of infection from venereal disease is 75 times greater in the large towns than it is in the country districts, and that far more active measures are required to combat the disease in the crowded communities than elsewhere. That the relative preponderance of venereal disease in the large towns coincides broadly with the incidence of prostitution is the inevitable conclusion from these facts and figures, and if the problems of venereal disease are those of prostitution it is only by reforms in the conduct of prostitution that an appreciable reduction of venereal disease can be anticipated. This, the moral of Dr. Sederholm's communication, is a point of view not shared by all the other members of the Board of Health to which Dr. Sederholm belongs. This body, apparently, is in favour of the abandonment of regulation of prostitution in any form, and relies mainly on educational methods and free treatment for every patient.

THE AUDIBILITY OF GUN-FIRING.

SEVERAL correspondents have written recently calling attention to the unusual audibility of the gun-firing in Flanders, so that a paper read at the last monthly meeting of the Royal Meteorological Society by Mr. Miller Christy and Mr. W. Marriott has a topical interest. The audibility of the gun-firing in Flanders over the south-east of England has been repeatedly noticed since an early period of the war, but Mr. Christy says that undoubtedly the intensity of the sound varies considerably with the quality of the guns and the meteorological conditions. Sometimes slow and deliberate firing is heard at the rate of 3 to 12 shots a minute, each shot being quite loud and distinct. This is probably the firing of the monitors and other warships bombarding the German positions on the Belgian coast. Usually, however, the firing has been much more rapid, much less distinct, and apparently more distant. This is, no doubt, the sound of the fighting further inland—say, around Ypres, Dixmude, or Arras; it varies in rapidity from perhaps 4 or 5 shots to the minute up to more than 100. This sound is, as a rule, very faint, though easily perceptible and quite unmistakable; it resembles more nearly a dull and distinct thud, which is rather felt than heard. From the records collected it appears that the gun-firing has been heard at one time or another over the counties of Essex, London, Kent, Surrey, and Sussex, the most distant place being about 150 miles from Ypres. Mr. Marriott, in discussing the meteorological conditions under which the gun-firing was heard, said that the weather charts showed that generally there is a somewhat irregular, or not definitely defined, distribution of barometric pressure, but mostly with a region of high pressure wedged in between areas of slightly lower pressure. These conditions are such as to produce light winds at the surface, mostly between north and east, over the neighbourhood of the North Sea. Aspect and elevation are also important factors for the hearing of the firing, so that there is nothing mysterious about the audibility altering so greatly as it obviously does. The weapon and its position, the weather and its modifications, all combine to make the audibility vary from day to day.

INDUSTRIAL ANILIN POISONING.

THE paramount position of the anilin industry in Germany has naturally caused the experience of anilin poisoning to be mainly German. The production of anilin dyes in England consequent on the war is likely to familiarise us with anilin poisoning. The United States made no attempt to compete with Germany in the manufacture of anilin or anilin dyes until the supply was shut off by the war, but in the *Journal of the American Medical Association* Dr. R. V. Luce and Dr. Alice Hamilton now publish an important paper on Industrial Anilin Poisoning, based on experiences in the tyre factories of Akron, Ohio. Apart from the production of anilin colours, anilin is used in America in the compounding of rubber, especially for tyres, and in reclaiming rubber from scrap. When the war suddenly shut off the supply from Germany rubber manufacturers began to manufacture anilin, so that now to the men exposed to anilism in rubber manufacture must be added those engaged in producing the anilin. Industrial anilin poisoning, which a few years ago was negligible, suddenly assumed importance. So far the making of dyes is too new in the United States to furnish cases; those reported come from the rubber industry and from the use of a wash for printers' ink which contains anilin. The victims are known as "blue boys," from the cyanosis which is so prominent a symptom. Since the discovery of the cause of the trouble the rubber manufacturers have taken measures of protection, either by installing exhaust ventilators or simply by warning the men to seek the open air as soon as flushing of the face and violent headache come on. Pure anilin has never been known to cause poisoning; but pure anilin is not used in industry. What is known under this name is a mixture of anilin (amidobenzene) with metatoluidin, paratoluidin, orthotoluidin, and xylidin in varying proportions. Unlike most volatile poisons, anilin gives no warning, for it does not irritate the eyes and throat. Yet according to the researches of Lehmann, anilin is toxic in even smaller doses than benzene, chloroform, or carbon disulphide. Most of the industrial cases follow spilling or splashing of anilin over clothes or skin, and doubtless both skin absorption and lung absorption play their part. Rambousek places anilin and all the nitro and amido derivatives of the aromatic series among the blood poisons the principal action of which is to cause the formation of methæmoglobin, in which the oxygen is firmly bound, thus producing a condition of "internal suffocation." In England Dr. W. Malden has examined the blood of men employed in the manufacture of anilin dyes and nitrobenzene. In about half he found a high red count with a low colour index and many imperfectly developed red corpuscles. The spectrum of methæmoglobin could be detected only when it was present in the proportion of 1 part to 10 of oxyhæmoglobin. Loss of hæmoglobin ran from 5 to 50 per cent. Stained specimens showed great variations in the size of the red corpuscles. Basophilic granules were found. Dr. Malden believes that this is often the earliest sign of anilin poisoning, as it is of lead poisoning. The first

symptoms are weariness or sleepiness, flushing of the face, a sense of fullness in the head and even of slight mental confusion, dryness of the throat, and dysphagia. The colour of the face changes from red to livid blue, which may increase to a deep purple. The pulse is rapid and weak, the temperature subnormal. Headache comes on early and is often violent, accompanied by dizziness and nausea, and in the more serious cases there is decided dyspnœa, increasing mental confusion, and finally loss of consciousness. These symptoms are due to want of oxygen. Later symptoms — icterus, methæmoglobinuria, bladder irritation, and bronchitis—are caused by the elimination of the poison. In some cases the subjective symptoms are slight and the man seeks advice because of his livid or blue colour, which is alarming to him and his friends. Usually industrial cases do not exhibit the severest symptoms, but epileptoid convulsions and protracted coma have occurred and proved puzzling to the medical attendant. Recovery in the milder cases is prompt, the men usually returning to work on the following day, though the cyanosis often persists for several days more. Chronic anilism is described by von Jaksch as a condition resulting from repeated doses of the poison so small as not to set up symptoms of acute poisoning. There are more or less headache, nausea, vertigo, muscular twitchings, disturbances of vision, sense of exhaustion, and loss of strength. The skin is usually livid, or it may be jaundiced. In one American case the man was treated for heart disease because of his cyanotic appearance and dyspnœa on exertion.

MEDICAL WOMEN'S FEDERATION.

THERE has been for some years a Federation of Univerity Women with the object of facilitating the expression of united opinion and the concerted action of University women on matters specially affecting them, and this federation has local associations in the cities of England, Wales, and Scotland, and is affiliated with similar associations in Ireland and India. An association of registered medical women was established more than 35 years ago. Other associations have since arisen, and it is now proposed to do for medical women what has already been done for University women in general by means of a federation of their existing associations. An application for incorporation has accordingly been made to the Board of Trade. The affairs of the federation are to be managed by an elected council, each association sending representatives in proportion to its numbers, and the first appointed representatives, of whom Miss A. Helen Boyle, M.D., is president, and Miss Jane Walker, M.D., provisionally secretary and treasurer, have drawn up a scheme which is being circulated to all medical women. At the central office a register of medical women will be kept indicating the type of work upon which they are engaged, the posts open to them, details regarding assistantships, and the sale and purchase of practices, and so forth. There is to be a salaried secretary at this office ready to give members any information and help that they desire. It is intended to take special steps to deal with public work in connexion with war emergency, school inspection, health insurance, public health, and factory inspection, in order to secure the fullest possible coöperation between the federation and the various Government departments concerned. The promoters hope that every medical woman will join this federation and thus ensure its becoming a responsible professional body as well as a bond of communication between its members. The subscription has been fixed at one guinea entrance and one guinea annually, and intending members are asked to communicate at once with the secretary of the federation at 122, Harley-street, London, W. The federation is the natural result of the steadily widening sphere of woman in medicine.

TETRAGENUS SEPTICÆMIA.

IN the *Annali di Medicina Navale e Coloniale*, issued from Rome by the Italian Admiralty, Dr. Dante Ferraro, a senior medical officer in the Italian Navy, details two cases of generalised infection by micrococcus tetragenus which followed wounds of the feet and came under his notice in the naval hospital in Venice. In each case the wound of the foot seemed to heal, but two or three weeks later an indolent bubo formed and was opened. In each case there arose an endocarditis which ultimately led to the patient's invaliding out of the service. One also suffered from a tolerably severe nephritis. Dr. Ferraro quotes the case reported by H. Robinson in the *Journal of the Royal Army Medical Corps* for May, 1915, where an otorrhœa supposed due to typhoid infection was shown by blood culture to be caused by M. tetragenus, and he notes that certain French authors who investigated by blood culture 738 cases of pyrexia in men who had undergone antityphoid inoculation, found in five the micrococcus tetragenus which had not been previously suspected. It has been reported on ship board,[1] and Tremoliéres and Loew, mentioning 25 cases of this septicæmia seen in French armies during the war, divide them into three classes: (1) benign, temperature not above 102° F.; (2) severe, to 104°, lasting 8–10 days; and (3) a pleuro-pneumonia in which a few diplococci are found in blood culture along with a great majority of M. tetragenus.

AT the Royal Society of Medicine the Section of Surgery has arranged for a special meeting to be held on Friday next, July 21st, at 5 P.M., at which a paper will be read by Major Tait McKenzie, R.A.M.C., on "The Treatment of Convalescent Soldiers by Physical Means," illustrated by lantern slides of cases under treatment. Members of other sections are cordially invited, and the paper will have special interest for members of the Sections of Balneology, Electro-therapeutics, and Neurology.

THE death is announced of Dr. Walter William Hunt Tate, obstetric physician to St. Thomas's Hospital. We hope to publish a full obituary notice later.

[1] Home: THE LANCET, June 12th, 1909, p. 1715.

DONATIONS AND BEQUESTS.—By will the late Mr. Lestocq Robert Erskine left £200 each to the London Fever Hospital, the Royal Berks Hospital, and the London Hospital.—The late Mr. B. H. Deakin, town clerk of Monmouth, bequeathed £500 to the Monmouth General Hospital and Dispensary for the maintenance of a cot in the children's ward in memory of his daughter.

WATER-SUPPLY OF BIDEFORD (DEVON).—The Bideford town council has adopted a scheme for augmenting the water-supply of the town at an estimated cost of £13,588. A new reservoir is to be erected capable of holding 27,000,000 gallons, to be supplied from a collecting area of 900 acres, and this would be capable of yielding at least 350,000,000 gallons per annum.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

The Ontario Health Officers' Association.

THE fifth annual conference of the medical officers of health of Ontario was held in Toronto this year, Dr. A. J. Macaulay, of Peterborough, discharging the presidential duties, and Dr. John W. S. McCullough, chief health officer for Ontario, acting as secretary. Many interesting communications were read bearing on the public health of the province.

Dr. M. B. Whyte, superintendent of the Isolation Hospital, Toronto, read a paper on the Quarantine Period for Measles, a disease which has been widely prevalent in Ontario the past six months, and from the discussion which followed the consensus of opinion of 400 health officers was that 16 days' exclusion from school following exposure was needless. It was agreed that those who suffer from the disease should be quarantined for seven days after the rash appears unless there are discharges or epistaxis, and that as second attacks are rare, those who have previously had the disease need not be quarantined at all.

Dr. Fred. Adams, epidemiologist to the Toronto Board of Health, gave a résumé of his observations upon typhoid fever in Toronto in the last six years, showing a remarkable improvement in the condition. In 1910 the death-rate from typhoid fever was 40 per 100,000; five years later, in 1915, it was only 1·9, the lowest rate of any of the large cities in America. The chief factors in this reduction Dr. Adams ascribed to chlorination of the water-supply, pasteurisation of milk, certified milk, and a campaign against flies and outdoor privies.

Dr. J. G. Fitzgerald, of the Ontario Department of Health, read a paper on the Epidemic of Cerebro-spinal Meningitis which occurred among troops quartered in Toronto, and reported that "all the cases among troops in the Toronto Military District have recovered."

Among other interesting communications may be mentioned that of Dr. W. H. Park, Director of the Public Health Laboratories, New York City, who, speaking on the treatment of diphtheria, advised the use of antitoxin in large doses, adding that the intravenous use of antitoxin was more effective than either the intramuscular or subcutaneous. In severe cases he gave, he said, from 5000 to 15,000 units to a child, with correspondingly large doses in the adult. Laryngeal cases require early and large doses.

Major W. D. Sharpe (Brampton), who served as surgeon in the British Naval Hospital at Belgrade in the first year of the war, gave an interesting lecture on Sanitation in Serbia; and Captain Ruggles George, A.M.C. (Toronto), told the interesting story of the first Canadian Overseas Contingent, taking the contingent from Camp Valcariter in Quebec to the trenches in Flanders.

Ontario Medical Association.

The thirty-sixth annual conference of the Ontario Medical Association was held in Toronto at the beginning of June, Dr. Harry B. Anderson (Toronto) presiding. Over 450 medical practitioners from all parts of the province attended. Dr. Anderson, in his presidential address, discussed the important question of medical education in the province. He thought that there should be a strict uniform examination for the practice of medicine, and no granting of special privileges to those not fully trained and unequal to meet the requirements of the medical examination. He considered that from the standpoint of the medical profession the new Ontario Workmen's Compensation Act was most unsatisfactory in some particulars, notably the absence of a clause providing for the prompt and proper payment of the medical man for his services. Under this Act physicians in Ontario are practically compelled to attend injured workmen without pay. In dealing with the general organisation work of the profession in the province, the President stated that there were now some 35 local medical societies in the province ready to affiliate with the Ontario Medical Association. He alluded also to the large number of Canadian practitioners engaged in the war. Professor A. D. Blackader (Montreal) said that after the war Canadian physicians should favour the home-made or British-made drugs, as certain lines of drugs already made in Canada since the outbreak of the war had been entirely satisfactory. At the conclusion of this paper the President stated that he had a communication from the Federal Government to the effect that it purposes revising the Patent Medicines Act, and advising the association to make representations to the Government. A committee was appointed to take care of this matter. The therapeutics of pneumonia was discussed by Professor Solomon Solis Cohen, of Philadelphia, U.S.A., and Dr. Elliott P. Joslin, of Boston, read a paper on the treatment of diabetes, recommending the cutting down of carbonaceous foods and the exclusion of fats until the patient was got into a state of moderate fasting. Dr. John A. Wyeth, Dr. John A. Bodine, and Dr. C. H. Chetwood, of New York, explained the use of the moving picture in showing surgical technique. The demonstrations included hip-joint operations and kidney removals, and formed one of the features of the meeting. The following officers were elected:—President: Dr. A. Dalton Smith, Mitchell; Vice-President: Dr. Clarence Starr, Toronto; General Secretary: Dr. F. Arnold Clarkson, Toronto.

Toronto, June 24th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Malaria Committees Abolished in the United Provinces.

THE United Provinces Government has decided to abolish the provincial and divisional malaria committees which came into existence in the summer of 1910. A Government resolution explaining the reasons for this step says: "Some useful work has been done by provincial committees, but experience has shown that their duties, which have consisted in collecting information and suggesting remedies for disease, overlap with those of the Sanitary Board. These duties will be transferred to the Sanitary Board, of which the Inspector-General of Civil Hospitals will now become a member. The duties assigned to divisional malaria committees were of a similar nature to those of provincial committees. The divisional committees have proved to be inadequately equipped for their duties." Malarial survey is a condition precedent to the initiation and elaboration of anti-malaria measures, but it requires for its execution the service of experts, and divisional committees have not and cannot well have at their disposal any expert agency. The surveys that have been made at Saharanpur, Kosi, Nagina, and Lucknow have been the work of officers of the Sanitary Department, and all future surveys will be similarly initiated and controlled. In several divisions committees have already ceased to meet, and in the remaining divisions the results achieved are not such as to justify their further retention.

The Bombay Medical Union.

At the annual meeting of the Bombay Medical Union Dr. H. S. Shroff, the President, delivered an address of wide political scope. Alluding to the enlistment of members of the "independent medical profession" by Government at the local war hospitals, at base hospitals, and at several spheres of the war, he said that in the representation by the Bombay Medical Union to the Royal Public Services Commission it was stated that the cadre of the Indian Medical Service on the civil side could be reduced and could be replaced by civilian practitioners after competitive examination. It was in this way proposed that a civil medical department, when created, should form a reserve for the army in time of war; and since the outbreak of war 166 temporary commissions have been issued, out of which 32 appointments of lieutenants in the Indian Medical Service were made in England and 134 in India.

With reference to the Bill to prevent the grant to unqualified persons of titles implying qualifications in Western medical science and the assumption and use by such persons of such titles or designations implying such qualifications,[1] he said that the measure had been brought before the Council by "that sympathetic and statesmanlike member of the Council, the Director-General of the Indian Medical Service, who has been the custodian of the interests of that service and other services and keen to safeguard their interests, and who is also keen to advance the status and aspirations of the Indian medical profession."

The third subject to which the speaker referred as one to which the Union had been giving special attention was the

[1] THE LANCET, May 13th, 1916, p. 1011.

foundation of a new college in Bombay. The trustees of the late Seth Gordhandan Sunderdass Charities have offered to the corporation the princely donation of Rs. 12 lakhs from their funds for founding a medical college in Bombay. The corporation has taken an enlightened view of the proposal and has asked their Medical Relief Committee to report on its practicability. "The Bombay Medical Union," said their President, "is delighted with the offer, considering it to be conceived in the interests of medical science by the indigenous qualified profession. The present system of medical education in India was conceived in 1845, when not a single Indian was possessed of Western medical education and qualification. Naturally, officers of the Indian Medical Service in the employ of the Government were put in charge of teaching colleges like the Grant Medical College on our side. To those pioneers of medical education we owe a deep debt of gratitude for their unselfish efforts in the cause of medical education. But the pupils of the college, owing to the system of the covenants on which the European teachers were engaged when coming out to India, could not become teachers in their own college, though certain appointments have been made in the junior subject of botany." Dr. Shroff added that recently under the stress of war, three appointments from among the Indian medical profession had been made to professorial chairs.

Shortage of Medical Men.

The Government of India have had under consideration the question of offering enhanced terms to civil sub-assistant surgeons on military duty, including those already employed, who undertake liability for field service out of India and on expeditions based on the frontiers of India during the present emergency. They have now decided that each civil sub-assistant surgeon on signing the declaration, undertaking the liability to proceed on active service when ordered, will receive his civil pay, plus military pay, plus compensation for loss of private practice, plus an outfit allowance, free rations, and the usual service concessions for families. These liberal terms ought to draw a very large number of these men from civil to military employ, more especially as in addition to the above each sub-assistant surgeon will receive permanent promotion without departmental examination to the next higher grade, should such promotion become due whilst in military employment, provided that he has a good record of service generally and has been reported on by the military authorities as fit for promotion. Further, it has been specially provided that the civil prospects of such civil sub-assistant surgeons as volunteer for field service shall not be adversely affected. The fact of undertaking liability for field service will, on the contrary, be taken into account as conferring a special claim to consideration hereafter should prospects of promotion offer for which the sub-assistant surgeon is otherwise fit.

Plantain Juice as an Antidote for Snake-bite.

I recorded recently a case of alleged cure of snake-bite at Colombo by the use of plantain juice.[2] A case of snake-bite at Serampore will therefore be of interest where plantain juice was used. A servant of the principal of the Government Weaving College was bitten by a venomous snake in the foot. The principal applied a ligature eight inches above the bitten part and then cut it with a lancet and applied permanganate of potash, making the wound bleed freely. He then extracted some juice from a plantain tree and gave the patient about a cupful to drink. After drinking the plantain juice, the man seemed to recover a little, and the wound was washed. He was made to walk up and down, and in the morning, when the ligature was removed, the man was declared cured.

June 10th.

[2] THE LANCET, April 1st, 1916, p. 746.

THE RESEARCH DEFENCE SOCIETY.—The annual general meeting of this society has been postponed owing to the war, many of its members being engaged on active service, while others have their time fully occupied in various kinds of work on behalf of the sick and wounded in this country. But the propaganda work of the society is still actively carried on under the direction of Mr. Stephen Paget. Among the most recent literature issued by the society are reprints from the *Field* and *English Mechanic*, bringing before the public in clear language the value of scientific pathological work both to our Army and to the civilian population.

ASYLUM REPORTS.

Kingseat Mental Hospital (Aberdeen City District Board of Control) (Annual Report for the Year 1915).—The total number of cases under treatment during the year was 665, the average daily number resident being 527. The number of admissions amounted to 171, of which 49 were transferred from other asylums. Of those admitted 2 were not insane, 44 were curable, 107 were absolutely incurable, and in 18 the prospect of recovery was doubtful. The most prevalent forms of disease were those embraced under the term manic-depressive insanity, imbecility and idiocy, the alcoholic psychoses, primary dementia of adolescence, epileptic insanity, and arterio-pathic and senile dementia. With regard to the duration of illness prior to admission, it was found that of the direct admissions 93 had been mentally ill for less than three months, 8 for less than 12 months, and the remainder for over 12 months. Hereditary predisposition was present in 33 cases, and 18 had suffered from one or more previous attacks. The discharges during the year numbered 75, the percentage of recoveries on the admissions being 32·1, which was 4 per cent. lower than in the previous year. This decrease was due to the admission of 40 incurable patients from Edinburgh and Glasgow respectively. Excluding these extraneous admissions, the percentage of recoveries among the Aberdeen admissions was 40·4, being 4 per cent. higher than in 1914. There were 50 deaths—29 men and 21 women; of these, 12 were over 70 years of age. The war has had so far practically no material effect on the admission rate.

Middlesbrough County Borough Mental Hospital (Annual Report for the Year 1915).—The total number of cases under treatment during the year was 639, with an average daily number resident of 472. The admissions, which totalled 207, included 116 cases transferred from Newcastle City Asylum in April. There were 79 from the borough, a decrease of 5 as compared with the previous year, but the number resident was increased by 9. The proportion of the insane to the estimated population of the borough was 1 to 402, or 24·8 per 10,000, the figures for England and Wales being 1 to 266, or 37·6 per 10,000. The total number of discharges, 96, included 54 patients transferred to Chester Asylum. The recoveries were 30, making a recovery rate of 37 on the direct admissions. The report states that one of the patients who escaped was a man who had been in the asylum since shortly after it was opened in 1898. He was ordinarily well-behaved and was allowed a good deal of liberty, but he had a habit of talking to himself and cursing imaginary enemies while at work. One morning he did not return to breakfast, and when next heard of he was with the Royal Engineers in Flanders. The deaths numbered 58, making a rate of 12·2 on the average daily number resident. Post-mortem examination was made in 41 cases. There were 17 private patients on the register at the end of the year, 4 having been admitted, 1 discharged recovered, and 6 having died during the year.

County and City of Worcester Lunatic Asylum, Powick (Annual Report for the Year 1915).—The total number of cases under treatment during the year was 1531, the average daily number resident being 1262. There were 405 admissions, of which 144 were direct, the remainder being transferred from other asylums. The discharges numbered 83, of which 59 were recovered, making a recovery rate of 40·95 per cent. on the direct admissions. One patient was discharged "not insane." A male patient was prosecuted for a murderous assault on the son of the medical superintendent. He was found "Guilty, but insane." He was removed to a criminal asylum. An interesting medico-legal feature was that the man appealed against the verdict. The Court of Appeal held that the verdict "Guilty, but insane" was not a conviction, and that a man who was not convicted could not appeal. There were 99 deaths, making a death-rate of 7·9 per cent. on the daily average number resident. The principal causes of death were as follows: Pulmonary tuberculosis, 21; heart disease, 20; senile decay, 17; epilepsy, 8; and pneumonia, 6. Post-mortem examinations were held in 89 cases, a percentage of 89·8. On Jan. 1st, 1915, there were 24 private patients in residence. Four females were discharged. One male and two females died. On Dec. 31st, 1915, there were 19 remaining.

THE SERVICES.

INDIAN MEDICAL SERVICE EXAMINATIONS.

IT was recently announced that after the open competitive examination held last July for admission to the Indian Medical Service no similar examination would be held during the continuance of the war, but that such appointments as might be required to meet the absolutely indispensable needs of the Service would be made by nomination by the Secretary of State. To assist him in making these appointments which, as already announced, will be limited in number to the absolutely indispensable needs of the Service, Mr. Chamberlain has appointed a Selection Committee who will summon and interview such applicants as may appear to be *primâ facie* suitable, and make recommendations for appointment. Applications for appointment should be addressed to the Secretary of the Military Department, India Office, Whitehall, S.W., and should contain concise particulars of the applicant's medical degrees and career. Applicants must be over 21 and under 32 years of age at the time of application. Particulars regarding pay, promotion, &c., in the Service can be obtained from the Secretary, Military Department.

ROYAL ARMY MEDICAL CORPS.

Temporary Captain Fred W. Mackenzie (retired pay) relinquishes his commission on account of ill-health.

Temporary Lieutenants to be temporary Captains: A. L. Thornley, R. P. Williams, T. E. Ferguson, I. W. Magill, H. H. Taylor, G. Fleming, C. G. MacKay, J. N. F. Fergusson, C. Price-Jones, C. P. Symonds, G. Pollock, F. T. Rees, F. D. Johnson, J. M. Anderson, R. D. Clayton, T. J. Lydon, R. A. Facey, M. J. Houghton, R. S. Armour, W. Templeman, W. S. O. Waring, C. B. Kidd, P. M. MacLachlan, H. B. Lawson, A. Hipwell, H. V. Walsh, G. K. Thompson, D. B. Pascall, F. I. MacKinnon, J. C. McKerrow, T. P. Seymour, E. K. Gawn, D. Gillespie, J. W. Pettinger, H. M. Macgill, W. S. Finch, R. J. Harris, H. F. Holmden, C. G. Monro, H. G. Dresing, J. H. K. Sykes, C. K. McKerrow, J. T. Myles, J. I. Arnold, V. E. Badcock, W. H. Scott, H. H. Sloane, E. R. Fothergill, J. B. T. Keswick, L. Game, W. T. Williamson, W. Macleod, A. Mathieson, W. S. B. Hay, D. Fletcher, D. A. Donald, T. L. Fleming, C. B. Wainwright, T. W. Buckley, R. A. H. Fulton, C. N. Corbett, C. C. Worster-Drought, H. T. Lippiatt, S. J. Staples, M. Douglas, J. H. White, and A. Drouin.

Temporary Lieutenants relinquishing their commissions: G. W. Deeping, E. M. Rooke, E. L. Hickey, R. H. Williams, C. S. Thomson, R. H. Mercer, W. R. Morris, L. O. Weinman, G. W. Dryland, W. Bates, W. Doyle, E. Ryan, C. S. Woodd, A. J. Lomas, O. S. Wraith, D. C. Laird, B. H. Greensill, A. J. V. McDonnell, J. C. Walker, C. H. Sills, A. Bryans, E. R. R. Cheesman, H. G. Kilner, H. S. C. Darbyshire, R. Nairn, A. J. Turner, F. Copeland, R. V. G. Monckton, R. Rennie, T. R. Earls-Davis, J. D. MacKay, J. G. McLeod, M. J. Vigneux, E. V. Sullivan, W. E. Campbell, G. S. Williams, and F. J. Sadler.

To be temporary Lieutenants: A. Dewar, D. P. Blair, A. R. M. Brenan, J. Clark, R. E. Marwick, G. P. G. Beckett, C. F. Davey, W. St. A. Hubbard, A. P. Robertson, J. P. Mathie, J. A. B. Hammond, D. D. Pinnock, T. S. Law, E. G. H. Weir, J. B. Donaldson, G. D. Watkins, J. D. Doherty, J. M. Lazenby, R. R. Law, H. R. Mayo, and C. W. Brown.

P. D. Magowan to be temporary Lieutenant whilst employed at the Lord Derby War Hospital.

Canadian Army Medical Corps: Lieutenant F. H. Wheeler to be temporary Captain.

TERRITORIAL FORCE.

Army Medical Services.

Lieutenant-Colonel F. Kelly, Highland Field Ambulance, to be Assistant Director of Medical Services, a Mounted Division, with temporary rank of Colonel.

Captain W. T. Rowe, from Attached to Units other than Medical Units, to be Deputy Assistant Director of Medical Services, a Mounted Division.

Royal Army Medical Corps.

East Lancashire Field Ambulance: Captain A. Callam to be temporary Lieutenant-Colonel whilst commanding a Field Ambulance. Captain (temporary Major) H. W. Pritchard to be Major.

London Field Ambulance: Captain (temporary Lieutenant-Colonel) G. L. L. Lawson relinquishes his temporary rank on ceasing to command a Field Ambulance.

Northumbrian Field Ambulance: A. E. Raine to be Lieutenant.

Wessex Field Ambulance: Captain P. R. Bolus, from Attached to Units other than Medical Units, to be Captain.

Eastern General Hospital: Lieutenant-Colonel Sir T. Clifford Allbutt, K.C.B., F.R.S., resigns his commission.

North Midland Field Ambulance: Captain W. B. Williams relinquishes his commission.

East Anglian Division: Sir T. Clifford Allbutt, K.C.B., F.R.S., late Lieutenant-Colonel, Eastern General Hospital, is appointed to the Hon. Colonelcy of the R.A.M.C., East Anglian Division.

West Lancashire Field Ambulance: Major W. Macdonald to be temporary Lieutenant-Colonel whilst commanding a Field Ambulance. Captain M. I. Dick, from West Lancashire Field Ambulance, to be Captain.

Home Counties Division Sanitary Section: Lieutenant F. T. H. Wood to be Captain.

Welsh Casualty Clearing Station: Lieutenant A. W. Clarke to be Captain.

Attached to Units other than Medical Units.—Captain R. P. Ryan, from a Wessex Field Ambulance, and Captain H. G. Dodd, from a Northern General Hospital, to be Captains. Temporary Lieutenant C. A. E. I. Brownlee, from Royal Regiment of Artillery, and T. Higson to be Lieutenants.

VOLUNTEER OFFICERS' DECORATION.

Surgeon-Major W. Richardson, Isle of Man Volunteers, has received the Volunteer Officers' Decoration.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 largest English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7922 births and 3693 deaths were registered during the week ended Saturday, July 8th. The annual rate of mortality in these towns, which had been 12·3, 12·6, and 11·6 per 1000 in the three preceding weeks, fell in the week under notice to 11·1 per 1000 of their aggregate civil population, estimated at 17,312,295 persons for the year 1915. During the 13 weeks of last quarter the mean annual death-rate in these towns averaged 14·3, against 13·8 per 1000 in London. Among the several towns the death-rate last week ranged from 4·6 in Wimbledon, 4·7 in Ealing, 5·0 in Leyton, 5·5 in Eastbourne, and 5·8 in Gillingham and in Bournemouth, to 16·0 in Huddersfield, 16·1 in Lincoln and in Rochdale, and 16·4 in Walsall and in Darlington.

The 3693 deaths from all causes were 159 below the number in the previous week, and included 224 which were referred to the principal epidemic diseases, against numbers declining from 335 to 225 in the five preceding weeks. Of these 224 deaths, 61 resulted from whooping-cough, 60 from measles, 54 from infantile diarrhœal diseases, 36 from diphtheria, 9 from enteric fever, and 4 from scarlet fever, but not one from small-pox. The annual death-rate from these diseases was equal to 0·7 per 1000, and coincided with that recorded in each of the three preceding weeks. The deaths attributed to whooping cough, which had been 76, 77, and 55 in the three preceding weeks, rose to 61, and included 11 in London, 5 each in Birmingham and Sheffield, 4 in Sunderland, and 3 in Oldham. The deaths referred to measles, which had been 65, 67, and 68 in the three preceding weeks, fell to 60, and caused the highest annual death-rates of 1·1 in Sheffield, 1·5 in Oldham, 1·6 in Wolverhampton, 2·3 in Gillingham, and 3·1 in Dudley. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 52, 45, and 50 in the three preceding weeks, rose to 54, of which 19 were registered in London, 5 in Liverpool, and 3 in Nottingham. The deaths attributed to diphtheria, which had been 34, 27, and 29 in the three preceding weeks, rose to 36, and included 14 in London and 3 each in Tottenham and Birmingham. The deaths referred to enteric fever, which had been 11, 13, and 10 in the three preceding weeks, numbered 9, and included 2 each in Manchester and Bradford. The fatal cases of scarlet fever, which had been 9, 15, and 13 in the three preceding weeks, fell to 4, of which 2 occurred in London.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 1302, 1303, and 1273 at the end of the three preceding weeks, further fell to 1262 on Saturday last; 170 new cases were admitted during the week, against 149, 171, and 162 in the three preceding weeks. These hospitals also contained on Saturday last 1303 cases of diphtheria, 202 of measles, 173 of whooping-cough, and 47 of enteric fever, but not one of small-pox. The 887 deaths from all causes in London were 16 fewer than in the previous week, and corresponded to an annual death-rate of 10·7 per 1000. The deaths referred to diseases of the respiratory system, which had been 137, 157, and 107 in the three preceding weeks, fell to 95 in the week under notice.

Of the 3693 deaths from all causes in the 96 towns, 125 resulted from violence, and 264 were the subject of coroners' inquests, while 1168 occurred in public institutions. The causes of 34, or 0·9 per cent., of the total deaths were not certified either by a registered medical practitioner or

by a coroner after inquest. All the causes of death were duly certified in London and in its 14 suburban districts, in Sheffield, Leeds, Bristol, Bradford, and in 57 other smaller towns. Of the 34 uncertified causes, 6 were registered in Liverpool, 5 in Birmingham, 3 in Manchester, and 2 each in Stoke-on-Trent, Barrow-in-Furness, and Middlesbrough.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,372,000 persons at the middle of this year, 1067 births and 563 deaths were registered during the week ended Saturday, July 8th. The annual rate of mortality in these towns, which had been 12·2, 13·4, and 12·6 per 1000 in the three preceding weeks, fell to 12·4 per 1000 in the week under notice. During the 13 weeks of last quarter the mean annual death-rate in these towns averaged 15·3, against 14·3 per 1000 in the large English towns. Among the several towns the death-rate last week ranged from 1·6 in Ayr, 6·9 in Clydebank, and 9·0 in Dundee, to 15·5 in Paisley, 18·7 in Perth, and 19·6 in Kilmarnock.

The 563 deaths from all causes were 11 fewer than the number in the previous week, and included 46 which were referred to the principal epidemic diseases, against numbers increasing from 39 to 54 in the three preceding weeks. Of these 46 deaths, 19 resulted from measles, 8 each from scarlet fever and whooping-cough, 5 each from diphtheria and infantile diarrhœal diseases, and 1 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·0, against 0·7 per 1000 in the large English towns. The deaths attributed to measles, which had increased from 13 to 28 in the four preceding weeks, fell to 19, and included 10 in Glasgow and 2 each in Edinburgh, Dundee, Leith, and Greenock. The deaths referred to whooping-cough, which had been 7, 4, and 5 in the three preceding weeks, rose to 8, and comprised 5 in Glasgow, 2 in Aberdeen, and 1 in Coatbridge. The fatal cases of scarlet fever, which had been 6, 7, and 1 in the three preceding weeks, rose to 8, and included 4 in Paisley, 3 in Glasgow, and 1 in Kilmarnock. The 5 deaths attributed to diphtheria, of which 2 occurred in Edinburgh, were slightly below the average in the earlier weeks of the quarter. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 4, 11, and 13 in the three preceding weeks, fell to 5, and included 3 in Glasgow. The fatal case of enteric fever was registered in Glasgow.

The deaths referred to diseases of the respiratory system, which had been 75, 75, and 57 in the three preceding weeks, rose to 64 in the week under notice, but were 12 below the number registered in the corresponding week of last year. The deaths from violence numbered 23, against 28 and 22 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the registration area of Dublin 240 births and 134 deaths were registered during the week ended Saturday, July 8th. The annual rate of mortality, which had been 17·8, 15·9, and 17·3 per 1000 in the three preceding weeks, was 17·6 in the week under review, against 10·7 and 12·9 per 1000 in London and Glasgow respectively.

Of the 134 deaths at all ages, 28 related to infants under 1 year and 39 to persons aged 65 years and upwards. The deaths referred to the principal epidemic diseases numbered 12, and comprised 8 from infantile diarrhœa, 2 from scarlet fever, and 1 each from enteric fever and whooping-cough.

The causes of 4 deaths were uncertified, and 1 other was the subject of a coroner's inquest, while 48, or 36 per cent., of the total deaths occurred in public institutions.

During the same period 199 births and 93 deaths were registered in the city of Belfast. The deaths corresponded to an annual rate of 12·4, or 1·1 per 1000 less than in the previous week, and included 14 of infants under 1 year and 24 of persons aged 65 years and upwards. Two deaths were referred to measles and 1 each to whooping-cough and infantile diarrhœa. The causes of 2 deaths were uncertified, and 1 other was the subject of a coroner's inquest, while 24 occurred in public institutions.

A SPECIAL prize Fellowship of £100, offered by the Federation of University Women to encourage research on some questions of special interest in the present national crisis, has been awarded to Dr. Alice Lee, Fellow of University College, London, who is about to undertake an investigation into the birth-rate as affected by present conditions.

EDINBURGH FACULTY OF MEDICINE: THE ADMISSION OF WOMEN.—The recommendation of the Senatus Academicus that the classes in the Faculty of Medicine should be open to women was discussed by the University Court on Monday last and the principle agreed to. A committee was appointed to prepare a scheme to carry out the recommendation.

Correspondence.

"Audi alteram partem."

THE NATURE OF THE CHANGES WHICH OCCUR IN MUSCLE AFTER NERVE SECTION.

To the Editor of THE LANCET.

SIR,—In your issue of July 1st there appeared a very interesting paper by Professor J. N. Langley on the above subject, concerning which I may perhaps be permitted to make a few comments from the clinical point of view.

1. Professor Langley suggests that the wasting of muscles after nerve section may be a "fatigue atrophy," owing to their being in a state of constant fibrillation. While continuous over-fatigue may explain their diminution in size, it obviously cannot account for these changes in electrical response. For these changes may persist after the muscle has apparently recovered and is again of normal size.

2. Reference is made to a paper of mine in which I advocated rhythmical tetanising contractions in the treatment of nerve-muscle injuries. I was careful to explain, however, that such treatment presupposed that it was desirable to cause contraction of some sort in any given case; and my contention was that rhythmical tetanising contractions were more effective than "galvanic twitches" or single condenser impulses. But I should not like it to be thought that I advocate contraction-provoking currents in every case of nerve injury. In cases of complete nerve severance where end-to-end union has been performed, artificially provoked contraction may be actually harmful in the early months. A mild sinusoidal bath is the most that should be used until there is some definite sign that the nerve trunk is again conducting motor impulses. This may be shown either by: (*a*) improved condenser response in the muscle itself; (*b*) signs of electrical conductivity in the nerve when stimulated above the site of injury; (*c*) faint return of voluntary power. When this stage of recovery has been reached my experience is that rhythmical tetanisation of the muscles, either by direct stimulation or by exciting the motor nerve, becomes of vastly greater value than the sinusoidal bath, or even than "single impulse" contractions. The greatest care must, however, be exercised not to over-fatigue the muscles.

3. With regard to the mode of disappearance of the electric responses after complete nerve blockage, observations with the condenser instrument show that the process is gradual, from 8 to 12 weeks being occupied in some cases before the extreme grades of the Lewis Jones scale are reached. This assumes a constant voltage of 100—the only change being in the size of condenser, and consequently the length of impulse employed. If the voltage be raised, a shorter impulse suffices. Not only so, but if a tetanising discharge is being used—as in my modification of the original Lewis Jones instrument—the more rapidly the impulses succeed each other the greater the effect, even though the individual impulses remain of the same length. It is thus easy to believe that *sufficiently violent faradism* might be able to cause contraction in any muscle, no matter how long severed from its motor nerve. From the clinical point of view, however, we are able to say that certain conclusions, sufficiently accurate to be of practical use, may be drawn from the response of muscle and nerve to electrical impulses of definite length delivered at a fixed voltage and under standardised conditions which admit of exact reproduction by various observers.

In conclusion, I would respectfully press upon the notice of the pure physiologists the old adage that "science is measurement," and urge them to abandon in their experiments the use of an instrument so notoriously incapable of standardisation as the faradic coil.

I am, Sir, yours faithfully,

F. HERNAMAN-JOHNSON.

Cavendish-square, W., July 8th, 1916.

THE PREVENTION OF BILHARZIA INFECTION

To the Editor of THE LANCET.

SIR,—I have found that 116 out of 596, or 19 per cent., of the fresh-water snails of Natal harbour cercariæ at this period of the year. Of those infected, 76 contain "tadpole" forms and 40 contain cercariæ with bifid tails. So far, these latter have only been found in one species of snail, Physopsis africana. The cercariæ with bifid tails are of five varieties. One of them possesses eye spots and is similar to that which has been associated with bilharzia disease amongst birds in Egypt. This form is uncommon. Another possesses a muscular pharynx; this also is a rare form.

The cercariæ which answer to the description of those which cause bilharzia symptoms in man and beast in Egypt and the Far East are the more common of the forms with bifid tails met with in Natal, being found in 14 per cent. of the specimens of Physopsis collected from Durban and in 15 per cent. of the specimens collected from the Umsinduzi river at Pietermaritzburg. One common form has very long prongs to the tail and is considered to be an avian trematode; the other has fan-like prongs to the tail and is believed to be the human form.

Of 31 specimens of Physopsis africana from the Umsinduzi river which I exposed to infection by miracidia obtained from the urine of a patient suffering from bilharziosis on March 31st, 14 specimens, or 45 per cent., contained cercariæ with bifid tails on April 22nd; whilst 6 young sporocysts were found in specimens of the same snail within 14 days after being exposed to infection in the same way. In 4 of these small cercariæ with bifid tails were seen; in the other 2 the cercariæ were young and ill-defined.

I am, Sir, yours faithfully,

F. G. CAWSTON, M.B., B.C. Cantab.

Pietermaritzburg, Natal, May 13th, 1916.

THE EFFECT OF FERRIVINE AND INTRAMINE ON SYPHILIS.

To the Editor of THE LANCET.

SIR,—In order to advance our knowledge of chemotherapy I asked Lieutenant-Colonel L. W. Harrison and Captain C. H. Mills to kindly persuade the eminent chemists, whom my work on the subject has bewildered, to come forward and discuss the statements which are said to be contrary to the knowledge we possess. Instead, they again quote Professor Bayliss, who I am sure would never have raised the objections he did had he studied my research work or repeated those experiments upon serum which formed the foundation of that work. Furthermore, all Professor Bayliss's objections were met by me in a letter which was published[1] before Colonel Harrison and Captain Mills wrote the letter which appears in your issue of July 1st. Professor Bayliss was the only speaker who criticised my views; therefore from the use of the word "chemists" there must still be at least one other who is hiding his light underneath a bushel. It is true that another speaker—namely, Dr. C. H. Browning, whom Colonel Harrison and Captain Mills quote—associated himself with Professor Bayliss. Perhaps Colonel Harrison and Captain Mills will either prevail upon Dr. C. H. Browning to come forward or will take it upon themselves to point out the highly speculative assertions to which they allude. A little discussion on this aspect of the subject would, I venture to think, lead to the dealing of the death blow to Ehrlich's theory of chemotherapy, which is not only the acme of speculation but illogical from start to finish. Your readers have probably noticed that not one single word in support of Ehrlich's views has emanated from one of those who appear to be so troubled by my own.

The mention of the Sp. pallida in the next paragraph only leads me to state once again that unless my work on the leucocytozoon syphilidis be repeated, it will be impossible for the critics to understand fully the other links in my chain. The Sp. pallida is not the cause of syphilis, and its death should not be our main aim in chemotherapy, the spore being the phase we should strive to kill. Now the spore is uninfluenced by salvarsan, while the Sp. pallida is killed almost instantaneously; therefore salvarsan does not cure syphilis, a fact we should all know, but do not realise. From the 400 odd injections of ferrivine and intramine I have administered, I have proved, I think beyond all doubt, that ferrivine will do exactly what salvarsan will not do, and *vice versa*. Ferrivine will remove indurative chancres, lymphangitis, and lymphadenitis, which salvarsan will not, but it will not cause the uniform disappearance of mucous papules, lesions which are particularly sensitive to salvarsan. Intramine acts as a complement to any metallic compound, and has caused lesions to disappear which have either been aggravated or have not responded to salvarsan. The rapidity with which intramine will remove the induration of chancres and the resistant skin papules is extraordinary. If Colonel Harrison and Captain Mills's experience gave them results different from those obtained by myself, would it not have been more in the interests of science if they had tried to find out wherein the difference lay, instead of stating that they had obtained such and such results; therefore the action of intramine and ferrivine is absolutely nil. No object would have been gained in my opening this discussion if the sulphur and iron compounds were perfect. We are now in the position of being able to abolish the worship of the German syphilitic trinity (Sp. pallida, Wassermann reaction, salvarsan) and to strike along paths of our making; hence my object in wishing for a discussion was to seek coöperation with a view to perfecting a non-toxic metallic compound which would render the use of the toxic element arsenic superfluous.

Before closing this letter I should like to point out that, with a view of rendering rational chemotherapy a British product, I handed over (December, 1915) a copy of my first paper on the subject before it appeared in THE LANCET (January, 1916) to the National Medical Research Committee, offering at the same time to lay the proofs of my statements before them and as much of the drugs to experiment with as might be required. No representative of that committee came to see me, or visited the Lock Hospital, or wrote for supplies of the drugs. In March, 1916, I wrote asking for the report of the investigations which had been promised me. All I received was the return of my paper. I sincerely trust that Colonel Harrison and Captain Mills will continue this discussion.

I am, Sir, yours faithfully,

Wimpole-street, W., July 2nd, 1916. J. E. R. MCDONAGH.

[1] Brit. Med. Jour., vol. i., 1916, p. 901.

SCARLET FEVER CARRIERS.

To the Editor of THE LANCET.

SIR,—In reference to Dr. Donald Hood's letter in your issue of July 1st *re* the infectious condition of patients desquamating after scarlet fever, the following case is of interest.

The patient, a girl aged 4, was admitted to the London Fever Hospital on Jan. 6th suffering from a mild attack of scarlet fever. The temperature rose to 101° F. on the second day of illness and then fell to normal. There were no complications of any kind, and the child was discharged six weeks later quite well, with no trace of desquamation. At no time was there any discharge from the ear or nose. She went to stay in the country with three elderly ladies. Ten days after she had been there one of these contracted scarlet fever and subsequently died. A sister who nursed her also contracted scarlet fever. The child, who was in perfect health and free from any trace of desquamation, then went home. On March 18th—i.e., a month after the child had left the fever hospital—her brother came home from school to spend the week-end. He contracted scarlet fever on March 23rd, had a mild attack, and recovered. When at home he had kissed his sister. Whether or no desquamation is in itself infectious is a disputed point. In this instance there was no trace of desquamation, but it is clear that the child was a scarlet fever carrier. I think there can be little doubt that the infection here lurked in the throat, but in our ignorance as to the nature of the organism responsible for scarlet fever it is impossible to detect carriers. I am, however, convinced from this and other similar cases that there are scarlet fever carriers who are not desquamating and have no nasal or aural discharges, and it seems practically certain that the infection is conveyed by the scarlet fever organism in the throat, which may in certain cases retain its vitality for a prolonged period, in the same way as the diphtheria bacillus in diphtheria carriers. I am, Sir, yours faithfully,

July 3rd, 1916. JOHN F. H. BROADBENT.

THE INFECTIOUS CONDITION OF PATIENTS DESQUAMATING AFTER SCARLET FEVER.

To the Editor of THE LANCET.

SIR,—Dr. Donald W. C. Hood in your issue of July 1st relates an interesting instance which points to the probability of an officer with desquamating feet having infected other officers occupying beds in the same ward. Dr. Hood apparently jumps to the conclusion that, granted the fact of infection, this was due to the desquamation. It is more probable, however, that it was due to infectious particles discharged from the nose or throat. Every medical officer of health knows of many cases of scarlet fever which appear to be infectious long after desquamation as well as all other pathological conditions have ceased. When this occurs with diphtheria we are commonly able to detect diphtheria bacilli in the throat or nose. We have not got the advantage of bacteriological diagnosis for scarlet fever, but analogy would indicate that the source of infection is the same as it is proved to be in diphtheria—viz., the naso-pharynx.

I am, Sir, yours faithfully,

SIDNEY DAVIES,
Medical Officer of Health.

Public Health Department, Town Hall, Woolwich.
July 10th, 1916.

FAT-HEADEDNESS.

To the Editor of THE LANCET.

SIR,—The letter of the Director of the Westminster Hospital Laboratory published in your issue of July 1st points a valuable moral and well illustrates the prevalent neglect of science and want of coördinated intelligence in authoritative headquarters. Laboratory assistants engaged in the work indicated by Dr. R. G. Hebb are not trained in a day, and it is well known that medical assistants in any branch of work are scarcely to be found at the present time. It is needless to insist on the necessity of a pathological laboratory as an integral part of an up-to-date hospital; the average layman knows this quite well. But some in authority seem to think that there is virtue in a laboratory without workers, just as others responsible for the National Insurance Act seemed, at least at first, to be of opinion that adequate medical attendance consisted in a momentary interview and a bottle of physic.

Dr. Hebb supposes that there is no use in appealing. But it seems to me that if the governing body of Westminster Hospital were to appeal to the Army medical authorities a possible cure for this particular case of official lipocephaloma might easily be achieved.—I am, Sir, yours faithfully,

London, July 6th, 1916. H. BRYAN DONKIN.

To the Editor of THE LANCET.

SIR,—Dr. R. G. Hebb, in his letter which appears in your issue of July 1st, does not mention by whom the application for the exemption of his laboratory assistants was made. If it was made by himself, and was in a tone approaching that of his letter, can it be wondered at that it was refused?

An application was made on behalf of a similar official at the hospital which I write from, and on appearing before the tribunal we were treated most reasonably and courteously. We did not get all we asked, but we should certainly not characterise as a "fat-headed committee" a body of gentlemen who did not see eye to eye with us, but who are doing their duty to their country (and a very difficult duty) as well as Dr. Hebb himself.—I am, Sir, yours faithfully,

July 5th, 1916. HOSPITAL SUPERINTENDENT.

WOMEN STUDENTS AT THE LONDON HOSPITALS.

To the Editor of THE LANCET.

SIR,—Sir John Broadbent's letter in your issue of to-day demands a word of explanation from me. I only mentioned St. George's Hospital as having admitted women students to its wards because that hospital was the only one of the four hospitals with which we at King's College are associated which had taken this step up to the date of my letter. I was dealing with the matter solely from the point of view of providing clinical instruction for women students who take their preliminary and intermediate work with us. I was quite aware that St. Mary's Hospital had thrown open its doors to women students, and I understood from a letter which Sir John Broadbent wrote to me about a month ago that his agreement with the London School of Medicine for Women precluded him from taking women medical students from any other source. From the King's College standpoint, therefore, St. Mary's Hospital was of no use to us, and that is the simple reason why I omitted to mention their recent action. I am, Sir, yours faithfully,

W. D. HALLIBURTON,
Dean of Medical Science Faculty, King's College, London.

July 8th, 1916.

THE SHOCKLESS OPERATION.

To the Editor of THE LANCET.

SIR,—I have read with great interest Mr. P. Lockhart-Mummery's article with the above title in your issue of July 1st, and only wish he had been present in 1914 at the discussion on "Anoci-Association" at the annual meeting of the British Medical Association, when Colonel H. M. W. Gray had a very hostile audience to face until his subsequent demonstration in his theatre at the Aberdeen Infirmary. Having used Colonel Gray's technique for the past four or five years and seen a good deal of his own work, I would like to touch on a few points which may prove interesting to Mr. Lockhart-Mummery and others who are following Crile's methods.

As regards the preliminary narcotic, I find that omnopon and scopolamine or alopon and scopolamine, the latter an Allen and Hanburys' preparation, are preferable to morphia and scopolamine—the former give a quieter sleep with much less headache and morphia squeamishness afterwards. The use of nitrous oxide or any inhalation anæsthetic is unnecessary if the preliminary narcotic is given in suitable dose and the system of local anæsthesia is perfect. One cannot be sure of having blocked all noci-ceptors if the patient is "quite unconscious," although a skilled anæsthetist might observe "signs of stimulation." Another objection to nitrous oxide and oxygen analgesia is the risk of considerable struggling; this, of course, is not very frequent but might prove very dangerous after the abdomen was opened, and I have it on the authority of a very skilled administrator of nitrous oxide that this struggling is by no means uncommon. Personally I have managed appendicectomies, gastro-enterostomies, prostatectomies, cholecystostomies, cholecystectomies, ovariotomies, and amputation through thigh and leg without any inhalation anæsthetic, but find it advisable to give a very little open ether along with the regional anæsthesia and narcotic in hysterectomies, big resections of bowel, and in renal operations. If we inject novocaine solution well to the side of the abdomen between the ribs and ilium we get a vastly improved abdominal relaxation which permits of far more easy exploration of the abdomen, and consequently much less need of a general anæsthetic.

For the semi-isolated general practitioner doing surgery these methods are of great value but have to be seen to be understood and require a considerable amount of practice, and the use of nitrous oxide and oxygen is rather a bar to their more universal adoption. I must add a warning word about chloroform which Mr. Lockhart-Mummery says may be given—one has to use a certain amount of adrenalin with the novocaine, and I have seen one or two cases where I could not help thinking that the combination of adrenalin and chloroform had dangerous results—it may not be so, but others have had the same experience as myself. Colonel Gray's technique of injection is very different from that advised by Crile and Lower in their work on the subject, and by allowing more time to elapse between the preparation and the attack achieved by infiltrating all layers of the abdominal wall prior to using a knife at all, seems to me to be a sounder method though more difficult to achieve proficiency in. I have no doubt that, had Colonel Gray been still in civil practice, we would have had by this time a very interesting résumé of his experience in this work on our bookshelves, and we must remember that he was the pioneer of "The Shockless Operation" in this country, and was working on these lines while many of us were students in his wards.

I am, Sir, yours faithfully,

Banff, July 3rd, 1916. W. MANSON FERGUSSON.

ATROPA BELLADONNA.

To the Editor of THE LANCET.

SIR,—My attention has just been called to an annotation on the Cultivation of Medicinal Herbs which appeared in THE LANCET on June 17th, in which the passage occurs "Belladonna is a weed in this country." I am inclined to think this must refer to the woody nightshade (Solanum dulcamara), and not to the official plant. Atropa belladonna does grow wild but not to a very large extent; a mature plant is shrub-like, 4 to 5 feet high, with as many as 20 stout stems to a root. The matter was referred to in the *Daily Mail* of June 10th, and my name mentioned as a grower of belladonna; in consequence I have received many hundred specimens for identification, only about 1 per cent. of which were belladonna, and nearly all the remainder the woody nightshade. We have not nearly sufficient belladonna in this country for our national requirements, but with foxglove the case is different—there is abundant—but frequently growing in remote districts making the picking and transport to manufacturers difficult. Systematic cultivation of both these plants will greatly lessen the cost, and at the same time make us independent of foreign supplies.

I am, Sir, yours faithfully,

J. BEETHAM WILSON.

95, High-street, Dorking, July 6th, 1916.

*** Our note, of course, referred to the official plant, which is a widely distributed wild plant on the chalk soils of the east and south of the country. We are aware that the public almost to a man believes that Solanum dulcamara is the belladonna of the Pharmacopœia. In referring to belladonna as "a weed" we did not mean to imply that it was very common, but that where it occurred it grew without cultivation.—ED. L.

"PIRATE" DOCTORS.

To the Editor of THE LANCET.

SIR,—Permit me to correct a few inaccuracies in your correspondent's letter of July 1st headed "'Pirate' Doctors," in which I am personally accused of attacking doctors for demanding what he alleges are reasonable fees. This is the direct opposite to what my letter of June 12th states. I there stated that, thanks to the loyal help afforded by the majority of those acting as locums, the demand had been so far met at reasonable fees, and that the demands of the very small minority, with whom your correspondent associates himself, could soon be stopped by refusing to pay their demands.

Surely in such times as the present no one with any patriotism would for a moment suggest that the time is ripe for the profession to raise their fees by the 150 per cent. your correspondent hints at. I have yet to learn that those who have so nobly given up their practices and joined the Royal Army Medical Corps to help their suffering fellow-countrymen are receiving, as he alleges, £2 or £4 per day. In my ignorance, I understood the remuneration was usually 24*s.* a day or about the same as paid to a locum tenens, except that the latter has no outgoings to pay and runs no risks. May I also remind your correspondent that within my recollection locum tenens' fees were £2 2*s.* to £3 3*s.* a week, and therefore the present fee of £7 7*s.* which he considers inadequate is an increase of over 200 per cent.

Once again may I thank the large majority of locum tenens and others who are loyally trying to keep together the practices of those who have joined the Royal Army Medical Corps.—I am, Sir, yours faithfully,

PERCIVAL TURNER.

Adam-street, Adelphi, W.C., July 11th, 1916.

CHELSEA HOSPITAL FOR WOMEN.—The new buildings of the Chelsea Hospital for Women in Arthur-street were formally opened by the Queen on Tuesday last. The hospital was established in 1871 in the Fulham-road, and its useful work has long been hampered by inadequate accommodation, especially in the out-patient department. There were formerly 50 beds for in-patients, and accommodation is now to be provided for 80. A sum of £30,000 is still required to complete the building scheme.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Captain H. C. Mulkern, R.A.M.C., received his medical education at St. Mary's Hospital, London, and qualified in 1905. When war broke out he was a surgeon at the Kingston Barracks Military Hospital, and joined the R.A.M.C. in December, 1914.

Lieutenant D. Rodger, R.A.M.C., qualified in 1907 at Manchester, and took the F.R.C.S. Edin. in 1912. Proceeding to Australia, he became Ophthalmic Inspector of Schools to the Queensland Government, and relinquished the appointment to take up war work, joining the R.A.M.C. in December, 1915.

Died of Wounds.

Lieutenant E. C. Lambert, R.A.M.C., attached to the East Surrey Regiment, received his medical education at Westminster Hospital, and qualified in 1898. He had held appointments at Banstead, Darenth, and Hanwell Asylums, and prior to joining the R.A.M.C. in December, 1915, was assistant medical officer at Wandsworth workhouse.

Died.

Lieutenant-Colonel C. Monk, I.M.S., qualified in 1874, and was for some time surgeon at the Military Hospital, Seinitya. He was in retirement when the war broke out, and died after an operation at the 2nd London General Hospital, of which he was lieutenant-colonel in charge.

Captain A. Seabrooke, R.A.M.C., was educated at Cambridge and at Guy's Hospital, qualifying in 1912, and was in practice in Grays, Essex, before joining the R.A.M.C.

Wounded.

Lieutenant A. C. Taylor, R.A.M.C.
Captain H. B. Goulding, R.A.M.C., attached to the Seaforth Highlanders.
Lieutenant P. H. Macdonald, R.A.M.C., attached to the Sherwood Foresters.
Captain A. Hamilton, R.A.M.C., attached to the West Yorks Regiment.
Captain W. K. A. Richards, R.A.M.C.
Captain J. H. Glover, R.A.M.C.
Captain J. H. Tomlinson, R.A.M.C.
Captain R. Dearsley, New Zealand Medical Corps.
Captain G. D. Fairley, R.A.M.C., attached to the Royal Scots Fusiliers.
Lieutenant J. R. Hall, R.A.M.C.
Lieutenant J. K. Muir, R.A.M.C., attached to the Northumberland Fusiliers.

Missing, believed Killed.

Captain J. L. Green, R.A.M.C., attached to the Sherwood Foresters.

Previously Reported believed taken Prisoners at Kut-el-Amara, now reported not Prisoners of War.

Brevet-Lieutenant-Colonel S. Anderson, I.M.S.
Captain F. H. Salisbury, I.M.S.

THE NAVAL BATTLE OF JUTLAND, MAY 31ST, 1916.

In the despatch received from Admiral Sir John Jellicoe, Commander-in-Chief of the Grand Fleet, and the subsidiary despatch of Vice-Admiral Sir David Beatty, the following references to medical operations occur:—

The work of the medical officers of the Fleet, carried out very largely under the most difficult conditions, was entirely admirable and invaluable. Lacking in many cases all the essentials for performing critical operations, and with their staff seriously depleted by casualties, they worked untiringly and with the greatest success. To them we owe a deep debt of gratitude.

Exceptional skill was displayed by the medical officers of the Fleet. They performed operations and tended the wounded under conditions of extreme difficulty. In some cases their staff was seriously depleted by casualties, and the inevitable lack of such essentials as adequate light, hot water, &c., in ships damaged by shell-fire, tried their skill, resource, and physical endurance to the utmost.

HUDDERSFIELD WAR HOSPITAL MAGAZINE.—This is an addition to the journals published by several of our war hospitals, and like its contemporaries will devote its profits to extra comforts for the sick and wounded. Among the contents of No. 1, the July issue, is the first instalment of extracts taken from a diary recording the story of the retreat from Mons. Major E. G. Coward is the editor, and the price is 2*d.* monthly.

OBITUARY OF THE WAR.

JOHN GLADSTONE MACKENZIE, M.B., CH.B. GLASG.,

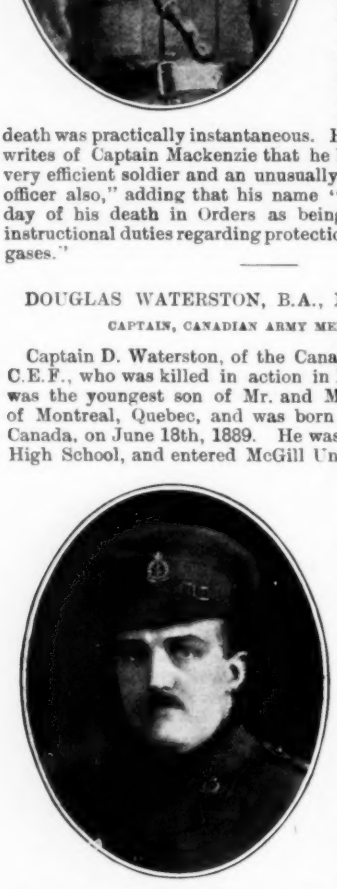
CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain J. G. Mackenzie, who was killed on active service in France on May 21st, was the son of Mr. John Mackenzie, formerly resident in Lanarkshire, Scotland, and now in Victoria, Australia. He graduated in medicine at Glasgow University in 1910 and then settled in practice at Wonthaggi, in Victoria, where, his brother tells us, he became an extremely popular practitioner. In August, 1915, he joined the Australian Army Medical Corps, becoming attached to the 8th Field Ambulance, and was transferred later to another section in France. He was killed by a shell which exploded at his feet near to his dressing station, and death was practically instantaneous. His commanding officer writes of Captain Mackenzie that he had "proved himself a very efficient soldier and an unusually well-qualified medical officer also," adding that his name "had appeared on the day of his death in Orders as being detailed for special instructional duties regarding protection against asphyxiating gases."

DOUGLAS WATERSTON, B.A., M.D., C.M. McGILL,

CAPTAIN, CANADIAN ARMY MEDICAL CORPS.

Captain D. Waterston, of the Canadian Field Ambulance, C.E.F., who was killed in action in Flanders on May 22nd, was the youngest son of Mr. and Mrs. Thomas Waterston, of Montreal, Quebec, and was born at Belleville, Ontario, Canada, on June 18th, 1889. He was educated at Belleville High School, and entered McGill University in 1905, taking his B.A. in 1909 with first-class honours in biology, and his degree in medicine in 1914. During his course in arts he contracted tuberculosis, and spent parts of 1909 and 1910 at Saranac Lake, New York State, where he happily made a good recovery. After graduation he was appointed interne to the Montreal General Hospital, holding this position until January, 1916, when he entered the Army Medical Service as Captain in a Canadian Field Ambulance, then being raised in Montreal. While on the resident staff of the hospital he qualified for a commission in the C.A.M.C., and received leave of absence to act as medical officer to the Mobilisation Camp at Three Rivers, Quebec, during the summer of 1915.



We learn from one of the physicians to the Montreal General Hospital that Captain Waterston was held in high esteem by his associates and by the visiting staff of the hospital. In entering his country's service he gave up the prospect of a brilliant career. He is the first medical officer from Montreal to make the great sacrifice during this war.

FREDERICK ALBERT CAPPS, L.R.C.P. EDIN.,

FLEET-SURGEON, ROYAL NAVY.

Fleet-Surgeon F. A. Capps, who was the senior medical officer on H.M.S. *Defence* when sunk with all hands in the naval battle on May 31st, was 50 years of age. He was educated at Plymouth and Edinburgh, taking his medical qualification in 1890, and obtaining 22 years later the diploma of D.P.H. with honours at the University of Ireland. After a short period of private practice he entered the Navy in 1892 and saw varied service on the Australian station and at Gibraltar. On promotion to staff-surgeon in 1900 he was appointed to Haslar for the second time, and was later in medical charge of the training ship *Black Prince* and at the *Mercury* submarine depôt. It was while here that he gained special experience in submarine life-saving apparatus and himself contributed some valuable inventions. He was promoted fleet-surgeon in 1908.

Fleet-Surgeon R. C. Munday, editor of the *Royal Naval Medical Journal*, to whom we are indebted for part of this account of his friend, writes of him: "It was characteristic of this officer that whatever his hand found to do was carried out with energy and industry. He never spared himself in his professional work, yet he found time to become a very clever carpenter and was a good tennis player."

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Second Lieutenant H. C. Dalby, York and Lancaster Regiment, eldest son of Major H. E. Dalby, R.A.M.C., of St. Mary Church, Torquay.

Captain R. S. Sweetnam, Royal Field Artillery, only child of Deputy Inspector-General J. L. Sweetnam, R.N., of Worthing.

Lieutenant R. T. Twining, Devonshire Regiment, only son of Dr. D. O. Twining, of Salcombe, South Devon.

Captain W. J. Davis, Northumberland Fusiliers, second son of the late Dr. R. Davis, of Orpington, Kent.

Lieutenant K. R. Traill, Royal Berkshire Regiment, younger son of Dr. C. G. Traill, of Sunningdale, Berks.

Lieutenant C. Vaisey, Royal Flying Corps, eldest son of Dr. T. F. Vaisey, of Winslow, Bucks.

Second Lieutenant C. V. Beddow, Devonshire Regiment, second son of Dr. J. Beddow, of Thorverton, Devon.

Second Lieutenant J. R. L. Hunt, Sherwood Foresters, only son of Dr. J. A. Hunt, of Borrowash, Derbyshire.

Second Lieutenant J. F. Baddeley, The Buffs, son of the late Dr. C. E. Baddeley, of Belvedere, Kent.

Lieutenant F. G. V. Beard, Worcestershire Regiment, eldest son of Dr. F. Beard, of Croydon, Surrey.

Lieutenant-Colonel G. A. Royston-Pigott, D.S.O., Northamptonshire Regiment, eldest son of the late Dr. G. W. Royston-Pigott, F.R.S.

Second Lieutenant W. Harrison, Gordon Highlanders, only son of Dr. J. Harrison, of Lesmahagow, Lanarkshire.

Colonel H. C. Bernard, Indian Army, attached to the Royal Irish Rifles, only surviving son of the late Dr. R. Bernard, Deputy-General-Inspector of Hospitals and Fleets, and Honorary Surgeon to the Queen.

Lieutenant D. Rodger, R.A.M.C., younger son of Dr. R. Rodger, West Kirby, Cheshire.

Second Lieutenant A. C. Brown, South Staffords, only son of the late Dr. J. Brown, of Tring, Herts.

Lieutenant (temporary Captain) A. Hodgkinson, Royal Warwickshire Regiment, youngest son of Dr. Hodgkinson, of Farnham.

A. Rieu, Middlesex Regiment, fourth son of the late Dr. C. Rieu, of Woburn-square, London.

Second Lieutenant J. C. M. Stewart, Royal Flying Corps, eldest son of Dr. J. Stewart, of Leeds.

THE GERMAN OFFICIAL CASUALTY LIST.

The editor of the *Queen* has pointed out to us the curious fact that the first four columns of figures as reported in the German Official Casualty Lists and issued on July 9th by the Press Bureau add up to an even number of hundred-thousands. The figures refer to the total casualties up to and including June, 1916, and are as follows :—

Killed and died of wounds	710,892
Died of sickness	46,435
Prisoners	152,793
Missing	189,880
Total	1,100,000

As the chances are 99,999 to 1 against the result being a coincidence, we must conclude one of two things—either the total of 1,100,000 was a rough approximation, in which case one of the four sets of figures, presumably that of the missing, was obtained by subtraction; or the German authorities were prepared as a matter of policy to admit the loss of 1,100,000 men, and arranged the figures to give this total. The coincidence does not inspire confidence in the accuracy of the German official figures as a whole.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Fellows of the College was held on July 6th for the purpose of electing four Fellows to serve on the Council, the President, Sir Watson Cheyne, being in the chair. 654 votes were received by post and 6 Fellows voted personally; 7 voting papers arrived too late :—

	Votes.	Plumpers.
W. F. Haslam	353	24
Raymond Johnson	315	23
T. H. Openshaw	282	33
V. Warren Low	217	39
F. J. Steward..	208	35
H. S. Pendlebury	177	21
J. Murray	160	6

The President declared Mr. Haslam, Mr. Johnson, Mr. Openshaw, and Mr. Low elected, and stated that Mr. Low would serve as substitute member in place of the late Mr. Stanley Boyd. The constitution of the Council is as follows: Retiring in 1917: Mr. W. Harrison Cripps (first elected 1905), Sir W. Watson Cheyne, President (first elected 1897), and Mr. Low. Retiring in 1918: Mr. Bilton Pollard, Sir J. Bland-Sutton, and Mr. W. G. Spencer. Retiring in 1919: Sir Berkeley G. A. Moynihan, Sir G. H. Makins (first elected 1903), and Mr. L. A. Dunn. Retiring in 1920: Mr. D'Arcy Power, Sir F. S. Eve, and Sir Anthony Bowlby, K.C.M.G. Retiring in 1921: Mr. J. Ernest Lane, Mr. H. J. Waring, and Mr. F. F. Burghard. Retiring in 1922: Mr. C. A. Ballance, M.V.O. (first elected 1910), Mr. W. Thorburn, and Mr. W. McAdam Eccles. Retiring in 1923: Mr. C. Ryall, Mr. Charters J. Symonds, and Mr. H. F. Waterhouse.

UNIVERSITY OF OXFORD.—At examinations held recently the following candidates were successful :—

DIPLOMA IN PUBLIC HEALTH.

Part I.—Isobel Mitchell.
Part II.—Elizabeth F. Butler and Alan Ker Soutar.

FIRST EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE.

Human Anatomy and Human Physiology.—H. G. Burford, Christ Church; F. B. Dutton and R. Gainsborough, Magdalen; T. Patterson, Non-collegiate; W. V. Robinson, New; H. W. Toms, Jesus; and B. Tordoff, St. John's.

SECOND EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE.

Materia Medica and Pharmacology.—C. W. W. Armstrong and R. M. Humphreys, St. John's; I. H. Beattie, Corpus Christi; E. A. Crook, New; W. Gover and R. T. F. D. Roberts, Balliol; J. J. Savage, Brasenose; and G. K. Stone, Trinity.

Pathology.—C. W. W. Armstrong and R. M. Humphreys, St. John's; G. K. Bowes, W. Burridge, R. B. Hervey-Wyatt, and R. W. Lush, Christ Church; G. R. Cowie, University; W. Gover, W. F. Harvey, and R. T. F. D. Roberts, Balliol; K. A. I. Mackenzie, Trinity; and G. H. Rossdale, Merton.

Forensic Medicine and Public Health.—F. L. Apperly and L. M. Davies, Lincoln; I. H. Beattie, Corpus Christi; J. N. L. Blamey and T. E. Micklem, New; G. K. Bowes, W. Burridge, and N. A. Sprott, Christ Church; J. M. H. Campbell and G. I. Evans, Magdalen; W. S. Dawson, Trinity; G. Perkins, Hertford; and S. C. Varley, St. John's.

Medicine, Surgery, and Midwifery.—J. N. L. Blamey and T. E. Micklem, New; J. M. H. Campbell, Magdalen; W. S. Dawson, Trinity; G. Perkins, Hertford; and N. A. Sprott, Christ Church.

EXAMINATION FOR THE DEGREE OF MASTER IN SURGERY.

A. L. Pearce Gould, Christ Church.

UNIVERSITY OF CAMBRIDGE.—At examinations for medical and surgical degrees held recently the following candidates were successful :—

FIRST EXAMINATION.

Part I., Chemistry.—E. G. Holmes, Christ's; H. A. A. Pargeter, Sidney Sussex; C. L. Pasricha, Caius; R. Y. Paton, Trinity; and A. E. Roche, Magdalen.
Part II., Physics.—E. G. Holmes and A. E. Slater, Christ's; J. Lund, M.A., Catharine; H. A. A. Pargeter, Sidney Sussex; C. L. Pasricha, Caius; and A. E. Roche, Magdalen.
Part III., Elementary Biology.—E. G. Holmes, Christ's; A. Jephcott, B.A., Queens'; J. Lund, Catharine; H. A. A. Pargeter, Sidney Sussex; and C. L. Pasricha, Caius.

SECOND EXAMINATION.

Part I., Human Anatomy and Physiology.—C. B. Clarke, Catharine; F. R. G. Hief and W. H. Palmer, Sidney Sussex; C. A. Horder and T. A. Jones, Emmanuel; T. Mensa-Annan, Peterhouse; W. S. Neave, B.A., St. John's; J. L. Potts, Caius; C. E. Taylor, Trinity Hall; D. Wallice, Clare; and C. H. Whittle, Queens'.
Part II., Pharmacology and General Pathology.—B. F. Armitage, B.A., H. Barbash, W. M. Heald, T. L. Hillier, S. C. Ho, B.A., and R. L. Williams, St. John's; P. F. Bishop, G. E. Burton, B.A., and F. C. Odling, B.A., Clare; C. V. Braimbridge, B.A., and M. S. Thomson, Downing; E. P. Brockman, E. C. Curwen, A. C. Halliwell, A. T. Hawley, R. A. Olphert, H. F. Squire, B.A., and G. H. Ward, B.A., Caius; T. A. Butcher, B.A., J. W. McK. Nicholl, B.A., and E. D. Spackman, B.A., Queens'; S. P. Castell and E. G. D. Murray, B.A., Christ's; C. B. Cohen and J. C. Davies, B.A., Trinity; A. J. Copeland, B.A., C. C. R. Downing, J. C. N. Harris, B.A., F. P. N. Parsons, J. P. Wells, and J. M. McC. Wright, B.A., Pembroke; G. A. Fisher, B.A., W. S. Gross, B.A., P. C. Livingston, and D. W. Winnicott, Jesus; A. G. F. McArthur, B.A., R. H. Reece, and R. H. O. B. Robinson, King's; P. M. Neighbour, B.A., Sidney Sussex; and N. Rumboll and W. S. Sykes, Emmanuel.

THIRD EXAMINATION.

Part I., Surgery and Midwifery.—E. H. R. Altounyan, E. A. Green, B.A., and W. T. Warwick, B.A., Emmanuel; K. B. Bellwood, B.A., and A. Orr-Ewing, B.A., Pembroke; W. H. Blackburn, B.A., Christ's; C. V. Braimbridge, B.A., and R. S. Woods, B.A., Downing; W. H. W. Cheyne, B.A., and H. W. Featherstone, B.A., Trinity; E. H. Dendy, B.A., L. W. Shelley, B.A., W. F. T. Haultain, B.A., and B. H. Swift, B.A., Caius; L. S. Gathergood, B.A., Sidney Sussex; F. E. Higgins, B.A., St. John's; J. Rickman, B.A., and H. G. E. Williams, B.A., King's; and H. A. Whyte-Venables, B.A., Queens'.
Part II.—E. H. R. Altounyan and W. G. A. Schüddekopf, B.A., Emmanuel; K. B. Bellwood, B.A., and V. C. Pennell, M.A., Pembroke; S. L. Bhatia, B.A., Peterhouse; H. V. Deakin, B.A., Trinity; E. H. Dendy, B.A., W. F. T. Haultain, B.A., and B. H. Swift, B.A., Caius; S. H. M. Johns, M.A., Clare; J. Rickman, B.A., King's; H. A. Whyte-Venables, B.A., Queens'; and R. S. Woods, B.A., Downing.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Second Professional Examination in Anatomy and Physiology held on June 29th and 30th and July 3rd, 47 candidates presented themselves, the following being successful :—

Ernest Edwin Carter, St. Thomas's Hospital; Henry Carter, London Hospital; Francis Cavers, University College; Arnold Edgar Collie, Cambridge University and Middlesex Hospital; Frederick Cyril Cozens, Cambridge University and St. Bartholomew's Hospital; Idris Davies and William Davies, University College, Cardiff; Reginald Stafford Foss, St. Thomas's Hospital; Edward Gallop, St. Bartholomew's Hospital; Blanche Sutton Gardner, London School of Medicine for Women; Dennis Herbert Geffen, University College; Ralph Byron Gibson, Sheffield University; Boris Abramovich Morshovich Gordon and William Rufus George Harris, London Hospital; Charles Harold Sterne Horwitz, Guy's Hospital; Arthur St. George Joseph McCarthy Huggett and Gilbert Rasleigh Hull, St. Thomas's Hospital; Santo Weisberg Jeger, University College, Cardiff; Loiza Elwell Johnston, American Medical Missionary College; Simon Kelly, Manchester University; Mohamed Khalil, Cairo and University College; Reginald Cyril Bell Ledlie, Guy's Hospital; John Neil Leitch, St. Bartholomew's Hospital; Horace Sharman Le Marquand and Charles Dundas Maitland, St. Thomas's Hospital; Ralph George Mayer, Guy's Hospital; Margaret Ombler Meek, Cambridge and London School of Medicine for Women; Gwilym Evan Morgan, Oxford University and London Hospital; Elizabeth Dill Russell, London School of Medicine for Women; Jivan Kumar Sanyal, Calcutta Medical College and London Hospital; Evelyn Cecil Whitehall-Cooke, St. Thomas's Hospital; Idwal Glynne Williams, St. Bartholomew's Hospital; Ethel Dorothy Willis, Manchester University; Julius Maurice Winnett, London Hospital; and Fuad Wanis Zaglama, Manchester University.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated :—

PRIMARY EXAMINATION, PART II.

Anatomy.—R. J. Allison, Manchester; J. G. Barrie, Guy's Hospital; R. A. D. J. Bernhardt, Middlesex Hospital; W. Breakell, Cambridge; J. F. E. Burns, Bristol; W. H. Cellier, Guy's Hospital; B. Y. H. Christmas, Middlesex Hospital; W. F. Gawne, Liverpool; W. S. Hazell, Bristol; A. M. Horsey, Cambridge; G. Hume, Guy's Hospital; H. Jennings, Liverpool; F. C. Jones, Manchester; G. Massie and W. W. Payne, Guy's Hospital; B. W. Roffey, St. Mary's Hospital; C. H. St. John, Guy's Hospital; R. R. Sara and J. A. P. Shaw, Cambridge; and T. C. Stephen, Manchester.
Physiology.—R. J. Allison, Manchester; R. A. D. J. Bernhardt, Middlesex Hospital; W. Breakell, Cambridge; J. F. E. Burns,

Bristol; W. H. Cellier, Guy's Hospital; K. R. Chapple, St. Bartholomew's Hospital; B. Y. H. Christmas, Middlesex Hospital; D. A. Dyer, King's College Hospital; W. F. Gawne, Liverpool; J. Gordon, Leeds; W. S. Hazell, Bristol; A. M. Horsey, Cambridge; G. Hume, Guy's Hospital; H. Jennings, Liverpool; F. C. Jones, Manchester; N. H. Kettlewell, Bristol; G. Masssie and W. W. Payne, Guy's Hospital; B. W. Roffey, St. Mary's Hospital; C. H. St. John, Guy's Hospital; and J. A. P. Shaw, Cambridge.

PRIMARY EXAMINATION, PART I.

Biology.—M. Fox, Royal Free Hospital; N. H. Kettlewell, Bristol; and G. R. A. de M. Rudolf, King's College.

Chemistry.—M. Fox, Royal Free Hospital; F. Lyth, H. Lyth, and J. A. Marriott, Manchester; G. R. A. de M. Rudolf, King's College; and G. A. P. Wright, Bristol.

Materia Medica and Pharmacy.—S. Robinson, Belfast; and F. A. Unwin, King's College Hospital.

UNIVERSITY OF GLASGOW.—The following candidates have passed the examination for the degrees of Bachelor of Medicine (M.B.) and Bachelor of Surgery (Ch.B.) in the subjects indicated—B., botany; P., physics:—

Gavin Haddow Boyd (B.), William Brock (P.), Joseph Dewar (B., P.), William Norman Duguid (B.), Bruce Paterson Gardner (P.), Thomas Gibson (B., P.), Charles Glen (B., P.) James Lorimer Halliday* (B., P.), David Russell Hamilton (B., P.), George Harvey (B., P.), Wesley Cope Houldsworth (B., P.), William Livingstone Kennedy (B., P.), William Martin M'Cash (B., P.), Thomas Simpson MacDonald (B., P.), Robert Kennedy M'Dougall (P.), James M'Nair (B., P.), William Muir (B., P.), George William Murray* (B., P.), James Nairne (B., P.), Malcolm Nicolson (B., P.), Alexander Hunter Rankin (B., P.), Thomas Gilfillan Rankine (B., P.), Donald Stewart (Partick) (B., P.), Alexander Symon (B., P.), Andrew Smith Taylor (B.), Charles Noel Temple (B., P), George Tudnope (B., P.), John Wyllie (B.), and John Yule (B., P.).

* Distinction in Physics.

UNIVERSITY OF ABERDEEN.—The following degrees were conferred at the recent Graduation ceremony:—

DEGREE OF DOCTOR OF MEDICINE (M.D.).

James Watt, George Byres, and Alexander William Overbeck Wright.

DEGREES OF BACHELOR OF MEDICINE (M.B.) AND BACHELOR OF SURGERY (CH.B.).

Robert James Clark, *William Corner (second-class honours), Alexander Henderson Craig, George Stewart Davidson, George Ewen, †Andrew Fowler, Douglas Morrison Milne Fraser, †Alexander Johnstone, Gordon James Key, Douglas Lyon, †Alistair Cameron MacDonald (second-class honours), George Strathdee Mather, John Archibald Nicholson, Alexander Keith Robb, †Douglas Somerville Scott, Robert John Smith, George Thomson, and William Duke Whamond.

* Passed Fourth Professional Examination with much distinction.
† Passed Fourth Professional Examination with distinction.

The John Murray Medal and Scholarship and the Lyon Prize were awarded to Dr. Arthur George Reid.

METROPOLITAN HOSPITAL SUNDAY FUND.—The following are among the amounts received at the Mansion House up to July 11th:—

St. Mark's, North Audley-street, £1402; St Columba, Pont-street, £491; St. Paul's, Knightsbridge, £304; Holy Trinity, Sloane-street, £310; Essex Church, Kensington, £246; St. Peter's, Cranley-gardens, £186; St. Mary-in-the-Boltons, £169; St. Mark's, Hamilton-terrace, £141; Holy Trinity, Tulse-hill, £139; Greek Church, Bayswater, £138; St. Stephen's, Gloucester-road, £135; St. Paul's, Onslow-square, £130; Emmanuel, Wimbledon, £123; Christ Church, Gipsy-hill, £118; St. Stephen's, South Dulwich, £117; St. John's Presbyterian Church, Forest Hill, £111; St. John's, Penge, £110; St. John's, Bromley, £108; Mr. J. A. Roberts, £100; St. John's Presbyterian Church, Kensington, and St. Mark's, Reigate, £98 each; St. Peter's, Bayswater, £91; St. Philip's, Kensington, £86; St. Michael's, Blackheath, £85; Westminster Abbey, £79; All Saints', Ennismore-gardens, £78; St. Anne's, Wandsworth, £76; Highgate Presbyterian Church, £74; St. Luke's, Hampstead, £71; St. James's, Piccadilly, £70; Christ Church, Lee, £68; Chipping Barnet Parish Church St. John's, Putney, and All Saints', Highgate, £62 each; Hornchurch Parish Church and Regent's Park Chapel, £60 each; St. John's, Notting-hill, and St. Nicholas, Chislehurst, £57 each; Christ Church, Beckenham, St. James's, West Hampstead, and St. Mark's, Marylebone-road, £56 each; St. James's, Kidbrook, £55; Union Chapel, Islington, £53; Messrs. J. H. Vavasseur and Co., £52 10s.; and Kensington Congregational Church and Mr. Norman McCorquodale, £50 each.

The total available for distribution to date amounts to about £45,500.

ANNUAL PROVINCIAL MEETING OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual provincial meeting of this society took place on July 1st at Hampton Court, when a large number of members attended from all parts of the country. Among those present were the President (Dr. Francis J. Allan, medical officer of health of the city of Westminster); Dr. John Robertson, medical officer of health of Birmingham (President-elect of the society for session 1916-17); Dr. C. W. F. Young, county medical officer of health of Middlesex; Mr. H. Beale Collins (Kingston); and Dr. B. C. Stevens (Mortlake). A business meeting was held in the forenoon, after which a visit was paid to some of the works of the Metropolitan Water Board under the guidance of Alderman R. Woolley Walden, J.P., chairman of the Water Examination Committee; Dr. A. C. Houston, Director of Water Examinations; and Mr. W. B. Warburton Stent, A.M.I.C.E., resident engineer at Hampton. Dr. Allan, in proposing a vote of thanks to the Water Board, referred to the vast improvements which had been effected. Fifty years ago London obtained its water from the Thames between London Bridge and Chelsea, and he remarked that an old guide-book to London of the year 1856 described that part of the river as being at once "our cistern and our sewer."

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The annual meeting of this association will be held on July 27th at 11, Chandos-street, Cavendish-square, W., at 2.45 P.M., when the following papers will be read: "Mental Disabilities for War Service," by Sir George Savage, and "Functional Gastric Disturbance in the Soldier," by Captain Colin McDowall, R.A.M.C.

WOMEN MEDICAL STUDENTS AT CHARING CROSS HOSPITAL.—We are informed by the Dean of Charing Cross Hospital Medical School that the council of the hospital have decided to admit women students to the medical school and hospital as a temporary measure. They will be admitted on the same terms as men students and can enter either for the full course or for the final studies only.

SPHAGNUM MOSS.—At the last meeting of the Devon Education Committee a letter was read from the Devon Voluntary Aid Organisation asking that school children might be encouraged to gather sphagnum moss, to be used as dressings for wounds. It was stated that a large quantity was required as quickly as possible. The committee decided to communicate with the local school authorities upon the subject.

EDINBURGH ROYAL INFIRMARY.—At a meeting of the managers of the Edinburgh Royal Infirmary held on July 3rd the following appointments were made:—Resident physician: Ernest O. A. Singer (final-year student) to Professor Sir T. R. Fraser (for three months). Resident surgeon: Ronald N. MacKenzie (fourth-year student) to Mr. A. A. Scot Skirving (for six months). Clinical assistant: Stanley E. Crawford, M.D. (Pennsylvania University, U.S.A.) to Dr. Norman Walker (for six months).

EUGENICS EDUCATION SOCIETY.—The Eugenics Education Society has been devoting considerable attention to the question of reducing the present penalisation of parenthood. At the general council meeting held on July 6th at the Grafton Galleries the following resolutions were unanimously adopted, and will be brought to the notice of those in authority:—

1. That it is desirable, without affecting the total amount raised by income-tax from the nation, to make changes in the incidence of the tax in order to decrease much further than has yet been done the heavy burden on parents with dependent children.

2. That the best way of securing this adjustment would be to assess the total income of a family as a number of separate incomes, the number bearing some relation to the number of persons the income has to support.

3. That the Executive Committee be empowered to take such steps as may seem advisable to bring this resolution to the notice of the Government.

Major Leonard Darwin, in his presidential address to the society, said that in the rebuilding of the nation after the war it will be far more important to strive to maintain the quality of the people than merely to increase their number. A general increase in the population has already been advocated to fill the gaps made by the war, whilst the poverty expected after the war has been made an argument for a decrease in the birth-rate. The density of the population results from a balancing of two opposing forces—the desire for marriage and the fear of the cost of maintaining a family. As to why different standards of living are thus established in the different grades of society the obvious reason is that differences of wealth arise by chance and are maintained by the inheritance of property. But there is another explanation. Men of exceptional natural abilities are constantly being selected out of the poorer ranks, whilst wastrels constantly keep falling down into them. The natural qualities leading to success pass on from generation to generation, and differences in the standard of living thus tend to be maintained. The principal cause of the lower fertility associated with greater wealth is that as prosperity increases so do the pleasures which compete with marriage. The efforts now made, however, aim at a transfer of wealth to the poor as a class and not to them individually, and such efforts are likely to increase the rate of multiplication of the classes affected. We have no right to assume that the existing high fertility of those at the bottom of the social ladder will not increase in future. No one is striving to weed out the unfit into a class apart or to make them multiply rapidly, but this is the direction in which we now seem to be moving. If so, there exists a growing cancer in the body of the nation which ought to be cut out at all hazards. Steps taken to increase the population are likely to be condemned as adding to the misery of the poor. But such fears must not prevent us from advocating an increase in the rate of reproduction amongst the fit.

Obituary.

PAUL H. RÖMER, M.D. MARBURG.

Paul Römer died on March 30th of typhus contracted on the Eastern front in his fortieth year. A native of Marburg, he spent most of his school and academic life there, and was one of von Behring's most trusted pupils. His work was constant and of a very high order; and his numerous contributions to medical literature are all distinguished by the same thoroughness and exactness, the same clarity of aim and expression. In this country Römer was best known as the author of a monograph on Epidemic Infantile Paralysis which has appeared in translation,[1] and which is a model of what a monograph should be. In tuberculosis his work went far towards firmly establishing the thesis that the majority of the human race by means of repeated small infections in childhood acquires such an immunity that tuberculous infection of an adult from without becomes a rarity. His friend, Hans Much, testifies[2] that Römer's life was as upright as his research work. Both were of a type which will be sadly missed.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Reports of Certifying Surgeons.

Clause 8 of the Police, &c. (Miscellaneous Provisions) Bill deals with the abolition of investigations of accidents by certifying surgeons. As amended in Committee by the House of Commons on Thursday, July 6th, it runs thus: "1. After the expiration of one month from the passing of this Act it shall cease to be the duty of certifying surgeons to investigate the nature and cause of death or injury caused by accidents in factories and workshops or in premises to which the provisions of the Factory and Workshop Acts, 1901 to 1911, relating to accidents, are applied, or to send to the inspector of the district reports thereof; provided that nothing in this section shall affect Subsection (3) of Section 73 of the Factory and Workshop Act, 1901, relating to the investigation by certifying surgeons of diseases occurring in factories and workshops. Provided also that it shall continue to be the duty of the certifying surgeon to investigate and report upon cases of injury caused by exposure to gas, fumes, or other noxious substances, or due to any other special cause specified in instructions of the Secretary of State as requiring investigation. It shall also be the duty of the certifying surgeon to investigate and report upon any case of injury which the district inspector of a factory in pursuance of any general or special instructions from the Secretary of State may refer to him for that purpose, and the Secretary of State shall issue instructions defining the causes of injury to which this provision is to apply and requiring the inspector of the district to refer to the certifying surgeon all such cases reported to him. The certifying surgeon shall have, for the purpose of the investigation in any such case, the same powers and shall be entitled to receive the same fee as he would if the case had been a case to which Section 73 applies. 2. As from the same date the enactments mentioned in the Schedule to this Act shall be repealed to the extent mentioned in the Schedule to this Act."

The presence of the original clause in the Bill led to very considerable debate on the second reading. The Home Secretary was then urged by a considerable number of Members to consent to the deletion of the clause, and he promised to bring forward an amendment to modify its provisions. That amendment has been introduced into the clause as set out above. It begins, "Provided also that it shall continue to be the duty of the certifying surgeon," and extends down to "the same fee as he would if the case had been a case to which Section 73 applies." The ground covered by the discussion ranging round this amendment was in the main that covered in the debate on the second reading. Very considerable objection was taken to the clause, particularly as it stood in its original form.

Sir P. MAGNUS, during the debate in Committee, said that the saving in money which the clause would bring about would only be £5000 or £6000 and it was not worth while to insert it in the Bill. He criticised the qualifications of inspectors of factories, and said that it was the certifying surgeon who alone possessed the scientific knowledge to judge questions relating to machinery and to mechanical, physical, and even chemical processes. It would be disastrous to the interests of the workpeople that the report should depend on the inspector only without the advantage of the consideration given by the certifying surgeon.

Mr. TYSON WILSON advocated dropping the whole clause. The workpeople who would be affected believed that the abolition of the certifying surgeons' reports would affect them prejudicially.

Sir ROBERT FINLAY considered that it would be better to leave it to the discretion of the certifying surgeon as to what cases required a medical report. Of course, if there were inspectors qualified by scientific knowledge to discharge the duties which were now discharged by the inspectors jointly with the certifying surgeons the evil might be mitigated, but it was very undesirable to abolish the reports of the certifying surgeons.

Mr. HERBERT SAMUEL (the Home Secretary) remarked that what had occurred did lead him a little bit to suspect that behind the scenes there must have been acting the very powerful organisation of the doctors which honourable Members knew was always ready to take active steps whenever their interests were in any way affected. The report of the Accidents Committee showed that the portion of the certifying surgeons' work which it was proposed to abolish was superfluous, and that the reports in effect were duplicates. All the factory inspectors were experts in mechanical safety appliances. The certifying surgeon did not treat the injured workman. He was not the man who examined him and diagnosed his case. His work was to see the workman and send in one of those reports which were, as a rule, entirely useless. The certifying surgeon had no power to take any action. The Bill did not propose the abolition of the certifying surgeon. The certifying surgeon would still continue to perform his most useful function of examining all young persons and children who were to enter a mill.

Several honourable Members asked the Home Secretary to drop the clause. Ultimately the right honourable gentleman's amendment in the form set out above was agreed to, and on a division the clause as amended was carried.

The Bill was read a third time by the House of Commons.

Cabinet Changes.

Several changes in the Cabinet are announced. Mr. LLOYD GEORGE has become Secretary for War. His place as Minister of Munitions has been taken by Mr. MONTAGU. Mr. MCKINNON WOOD becomes Financial Secretary to the Treasury, and Mr. TENNANT succeeds him as Secretary for Scotland.

HOUSE OF COMMONS.

WEDNESDAY, JULY 5TH.

Medical Arrangements in Mesopotamia.

Sir HENRY CRAIK asked the Secretary for India whether the report of Sir W. Vincent and General Bingley upon the medical arrangements in connexion with the Mesopotamia expedition had yet been received; and, if so, when it would be published.—Mr. CHAMBERLAIN replied: The report has not yet been received.

Mr. ANNAN BRYCE asked the right honourable gentleman whether the sum of at least 16 lakhs of rupees was put by princes and other wealthy persons in India at the disposal of the Government of India for the purpose of a proper medical equipment of the expedition to Mesopotamia; if so, what portion of that sum was applied to such equipment; and what department or officer of the Indian Government was responsible for the expenditure or non-expenditure of the money.—Mr. CHAMBERLAIN answered: No such gift has been reported to me by the Government of India. Several Indian chiefs combined to present a hospital ship for the general purposes of the war, and some motor ambulances, motor-cars, and the like have been presented by individual donors or by communities for the troops in Mesopotamia.

Inspectors of Factories.

Sir P. MAGNUS asked the Under Secretary for the Home Department what steps had been taken to give effect to the recommendations of the Committee on Accidents in Factories as to the examination to be passed by applicants for inspectorships, and whether nominations for the inspectorate were now limited to the classes of persons suggested in the report.—Mr. BRACE replied: The revision of the scheme of examination and conditions of nomination was being considered in consultation with the Civil Service Commissioners at the outbreak of war, and has had to be suspended for the time being. Meanwhile no fresh appointments to the permanent staff are being made.

The Health of Women Workers.

Mr. HASLAM asked the Parliamentary Secretary to the Ministry of Munitions whether he was aware that, where women worked the 8-hour shift system with 30 or 40 minutes' interval within the eight hours for refreshment, it

[1] Epidemic Infantile Paralysis. Translated by H. Ridley Prentice, M.B. London: John Bale, Sons, and Danielsson. 1913.
[2] Deutsch. med. Wochenschr., 1916, No. 24.

was reported that better results, both with regard to health and production, were obtained than under the 12-hour shift system; whether there were now any industries under his control where women were allowed to work longer hours than were permitted under the Factory Acts; if so, would he immediately take steps to stop this practice, which was shown by the report of the health of munition workers to be detrimental to health and effective production; and whether all cases of overtime worked by women workers were reported to the Home Office and required the sanction of that department.—Dr. ADDISON said in reply: It has generally been found that from the point of view of health a three-shift system, where practicable, is preferable to a 12-hour shift system. In a good many cases, however, the shortage of labour and difficulties of housing accommodation make a three-shift system impracticable, and the system involves also certain difficulties of organisation. On the other hand, a two-shift system where hours in each shift are not excessive is often quite satisfactory. As regards the second part of the question, it has been decided in concurrence with the Home Office to bring the hours of work for women and young persons in controlled establishments generally within the weekly limit of 60 hours allowed under the ordinary provisions of the Factory Act, and steps are being taken to give effect to this decision. Wherever an emergency necessitates any extension of hours the sanction of the Home Office is required.

THURSDAY, JULY 6TH.

Masseurs in Military Hospitals.

Mr. TYSON WILSON asked the Under Secretary for War whether he was aware that the members of the National Association of Trained Masseurs had made application for appointment as masseurs in military hospitals, and that although their qualifications were as good as those of persons who had been appointed their applications had been refused; and whether he would state why the War Office refused to avail itself of these fully trained masseurs.—Mr. TENNANT answered: Appointments of masseurs in military hospitals are made without reference to the institute or association to which the individual applicant may happen to belong. They are selected by an advisory committee consisting of masseurs, matrons, and medical men. Certain qualifications have been laid down which each candidate must possess before appointment, and no candidate is rejected if possessed of the necessary qualifications.

MONDAY, JULY 10TH.

The Notification of Anthrax.

Answering Mr. W. THORNE, Mr. LONG (President of the Local Government Board) said: The question of issuing an Order making all cases of anthrax compulsorily notifiable is under consideration.

British Prisoners at Ruhleben.

Answering Mr. MALCOLM, who asked whether any reply had been received from the German Government on the question of the treatment of British civilian prisoners at Ruhleben, Lord ROBERT CECIL (Under Secretary for Foreign Affairs) said: The note of the German Government, which was despatched within the time limited by our note, has now reached us. It denies that insufficient food is being given to the prisoners, and, while rejecting our proposal as to exchange, makes another proposal on the subject. His Majesty's Government are considering what reply shall be sent to it, and will communicate the German note and our reply to the House as soon as possible. In the meantime we are asking for a further report on the conditions at Ruhleben.

Cases of Insanity amongst Men of the Navy.

Mr. MACNAMARA (Secretary to the Admiralty) informed Mr. HOHLER that men invalided from the Navy for insanity attributable to the service, and in non-attributable cases those with length of service of 10 years and upwards to their credit, were, irrespective of the cause of insanity, sent to Yarmouth Hospital. The former, about 10 in all at present, were borne on full pay for a period of 18 months from first entry in a Naval hospital. In non-attributable cases sent to Yarmouth pensions were not payable, but the wives and children were granted small allowances out of Greenwich Hospital Funds. The total number of other Naval pensioners at present patients in public asylums was about 150, of whom about 15 were men discharged since the outbreak of war.

Patients at Royal Naval Hospital, Haslar.

Replying to Mr. RUPERT GWYNNE, Mr. MACNAMARA described in some detail the arrangements at the Royal Naval Hospital, Haslar, for the comfort and entertainment of patients.

Nerve-strain amongst Soldiers.

Mr. FORSTER (Financial Secretary to the War Office) informed Lord HENRY CAVENDISH-BENTINCK that no uncertifiable soldiers suffering from nerve-strain were treated in any other institutions than military war hospitals under the control of the War Office.

Lord HENRY CAVENDISH-BENTINCK asked whether any soldiers invalided through loss of mental balance had been discharged from the Army to asylums other than the three classes which he gave notice that he intended to discharge—viz., cases of general paralysis of the insane, chronic epilepsy, and nervous disturbance occurring in soldiers who had been in asylums before they joined the Army; and, if so, how many.—Mr. FORSTER answered: A limited number of cases which after a period of from four to six months' observation and treatment are considered to be incurable have been discharged to asylums. The number is 198.

TUESDAY, JULY 11TH.

Public Health Work.

In the course of his speech in Committee of Supply on the Estimates of the Local Government Board, Mr. LONG (the President of the Board) made a statement on various matters referring to public health. Dealing with the work of local Poor-law authorities, he said that they had provided a large number of beds for wounded soldiers in their institutions. Accommodation had also been provided by the local authorities for infectious diseases amongst soldiers. One-half of the medical staff at the Local Government Board had been engaged on war work. The work upon which they had been specially employed had been visitation of camps and billets and the inspection of food both at home and abroad. He had it from heads of the War Department that it was believed it was in no small degree due to the coöperation of the Local Government Board and the admirable services of officers of that department that it had been possible to maintain so high a standard of food for the soldiers. The Local Government Board had taken its part in the prevention of the spread of disease in the Army. During the period of nearly two years when enormous numbers of men had been collected in certain areas there was too often no sanitary arrangement, but nevertheless the health of the country had been wonderfully maintained. There had been a steady decrease in enteric fever. Cerebro-spinal fever, which at one time had caused a great deal of anxiety, was now practically causing the Board little or no anxiety. Small-pox, which at one time caused some alarm in the country, had been satisfactorily dealt with. There was no cause for anxiety now, and this, he believed, was due to the prompt action taken by medical officers of the Board. No fewer than 3,000,000 tubes of lymph were supplied by the Board to the troops.

Infant Welfare.

Probably one of the most grave facts borne in upon honourable Members (the right honourable gentleman continued) was that the country was losing through the war many of the best and strongest of the male population. Never was it more incumbent upon Parliament and the country than it was to-day to strain every nerve to see that the young members of the population were brought up so as to become healthy men and women. Probably there was nothing more important than work connected with the welfare of infants and of women both before and after the birth of their children. The Board had done its best to get local authorities to adopt schemes. Most local authorities had willingly coöperated. Schemes had been adopted for safeguarding the health of expectant mothers, nursing mothers, and of infants and young children. Nearly all the large urban districts had adopted these precautions. The Notification of Births Act, 1915, had already had very excellent effects, and he believed that as time went on admirable results would follow from this important change in the law. Grants had been made to local authorities. Nine hundred health visitors had been appointed, and there were also a great many voluntary societies interested in the work. Nursing associations were doing admirable work, and there had been visitation, inspection, and advice by the inspectors of the Local Government Board. There had been a decrease in infantile mortality. It had gone down to 110 per 1000 in 1915, and the first quarter of 1916 showed a much lower rate than the corresponding quarter of last year. He thought that there had been a tendency for Government departments to take up work which really belonged to other departments, and the result was overlapping. The Local Government Board was a department which ought to be solely charged with the health of the country. There ought to be no interference with the department.

Mr. WHITEHOUSE asked whether the right honourable gentleman thought that the medical inspection of school children ought to be taken over by the Local Government Board.

Mr. LONG said that his opinion was that the Education Department existed for education, and the Local Government Board existed for the health of the people.

Venereal Diseases.

There had been a very important report from a Royal Commission dealing with venereal diseases. He was glad to

say that he had been able to adopt, to a very large extent at all events, the recommendations of the Commission. He desired to pay a tribute of gratitude on behalf of the Government and the House of Commons to the Commission for the splendid work which it had done. There were no diseases which had done more injury to the life of the people and more destroyed their soundness than had venereal diseases. Their consequences were terrible, because these affected the succeeding generation. Nothing was more horrible than to see little children who had inherited venereal disease. He believed that if the recommendations of the Commission were followed consistently in the country a measure of relief would be given. The Commission had suggested that there should be facilities for diagnosis and treatment, that these should be available for the whole population, that they should be free of access, and it was recommended that if the work was done through the local authorities 75 per cent. of the cost should be found by the State. The Chancellor of the Exchequer had agreed that that grant should be given. An announcement was made by him (Mr. Long) to that effect, and schemes were coming into existence. The counties and county boroughs were organising facilities in connexion with institutions. The Local Government Board was issuing an Order, of which he had approved the other day, imposing this duty upon local authorities. The measures which the Board was calling upon them to take were—(1) that there should be laboratory facilities for free diagnosis; (2) that there should be clinics at the general hospitals for treatment; and (3) that there should be a gratuitous supply of the great remedy, salvarsan. He had seen in one of the London hospitals a ward set apart for the treatment of venereal disease, and he earnestly hoped that all the great hospitals in the country would give their immediate aid in this work. He knew that some of those responsible for hospitals entertained a fear lest the importation into their institutions of the treatment of this disease would injure the reputations of the hospitals. It would do nothing of the kind. It was only possible to deal with this fell disease satisfactorily if the provision was universal. If patients had to go long distances in order to get hospital accommodation he was afraid that they would not go, and the remedies would not be available for them. He was quite confident that there was no reason to fear that by offering facilities for the treatment of this disease any hospital in the country would suffer in credit or in the good opinion of those who supported it.

Appeal for Public Coöperation.

He invited the coöperation of local authorities, hospital authorities, medical men, and the public generally. He hoped that there might also be coöperation on the part of ministers of religion throughout the country, who could do a great deal to help in this beneficent work. Naturally there was a feature attached to this disease which did not belong to ordinary troubles. The patient did not like it to be known that he or she was suffering from it. Patients wanted to conceal the fact. Therefore, if they were to be dealt with, great care must be taken not only that there was proper provision for their treatment, but that everything that could be done was done to enable them to get it without unnecessary identification. One of the conditions which he had endeavoured to establish in consequence of this was that it should not be considered essential that a person coming to a hospital for treatment should belong to the district which the hospital served. He was requesting that questions should not be asked so as to identify the patients outside with the terrible misfortune that had overtaken them. It was desired to cure them and to eradicate this horrible disease. It could be done. If the Government received the assistance of people of all classes he believed that the time was not very far distant when this disease might be added to those the permanent ill-effects of which had been eradicated by satisfactory treatment.

Sanatoriums.

Although there was a shortage of medical men there were to-day 290 sanatoriums and hospitals and 11,743 beds which had been provided for the treatment of tuberculosis in England. There had also been 359 dispensaries provided, and there was to-day sufficient accommodation for our present demands. All soldiers and sailors suffering from tuberculosis could be provided for by those institutions. Most of these men were insured persons, and arrangements in their case were made through the Insurance Committees. But there were many soldiers and sailors who were not insured, and for them arrangements were made by the Local Government Board through the local authorities. There were also special arrangements for the treatment of officers at the King Edward VII. Sanatorium at Midhurst. The Board was not allowing its normal work in connexion with public health to fall behind, although it was embarking on no new fields of enterprise. It was impossible to exaggerate the importance of life-saving work, and of protecting women and children from the mortality which followed from preventable diseases. Some of those diseases, if they were not actually traceable to, were undoubtedly aided and abetted by, overcrowding, insanitary conditions in the homes, and by many of those social evils which had existed through so many generations and of which he was sorry to say the solution was not yet in sight. The Board had done its best to maintain the sanitary services. On the whole the record which he was able to present was not unsatisfactory.

Tribute to the Medical Profession.

After the war there were many problems which would present themselves for immediate solution—the housing of the people, public works, and further health provision. The Government had set up a Reconstruction Committee, and all these problems were under careful survey and examination. The nation must realise that the health of the people was a matter of first consideration. In some respects there was great room for improvement. Throughout the last year or two there had been an immense amount of voluntary work on the part of people of all classes. He desired to pay a special tribute to medical men throughout the country. Insurance work had thrown upon them an immense burden of work. A very large number of them had joined the Royal Army Medical Corps. That diminished the number available for work at home. Cheerfully and bravely had these men done their work. Let anyone examine the diary of their day's work and see what they were accomplishing. There was no grumbling. The nation owed a special debt of gratitude to these men, who were labouring in order that the population might be kept in good health. None at home were doing more than they were at present.

In the debate which followed general satisfaction was expressed with the statement made by the President of the Local Government Board.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BARROW, G. A., M.R.C.S., L.R.C.P. Lond., has been appointed Anæsthetist to the Manchester Royal Eye Hospital.

BROMLEY, L., M.B., M.C. Cantab., F.R.C.S. Eng., Assistant Surgeon to Guy's Hospital.

CONSTABLE, EVELYN A., M.B., B.S. Durh., Surgical Registrar to the London Temperance Hospital.

DORNFORD, A. C., L.S.A. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Faringdon District of the county of Berks.

HACKETT, J. A. W., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for the Gainsborough District of the county of Lincoln.

LLOYD, J. T., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Tregaron District of the county of Cardigan.

SCARBOROUGH, HILDA, M.B., B.S. Lond., Assistant Resident Medical Officer at Queen Charlotte's Lying-in Hospital.

THOMPSON, ROBERT BUSHER, M.B., Ch.B. Vict. Manch., Acting Deputy Medical Officer of Health for the Brixham (Devon) Urban Council.

WOOD-HILL, NELSON, F.R.C.S. Edin., M.R.C.S., L.R.C.P. Lond., Deputy Medical Officer of Health for Tiverton (Devon).

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BEDFORD COUNTY HOSPITAL.—House Surgeon, unmarried. Salary as arranged, with board, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street.—Resident Surgeon. Salary £200 per annum, with board, &c.

BIRMINGHAM UNIVERSITY.—Lecturer in Physiological Department. Salary £200 per annum.

BOLTON INFIRMARY AND DISPENSARY.—Female Second House Surgeon. Salary £200 per annum, with board, &c.

BRIGHTON, COUNTY BOROUGH ISOLATION HOSPITAL.—Resident Medical Officer. Salary £250 per annum, with board, &c.

BRISTOL GENERAL HOSPITAL.—House Physician. Salary at rate of £175 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Surgeons and House Physicians. Salary at rate of £120 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CROYDON, COUNTY BOROUGH ISOLATION HOSPITAL.—Resident Medical Officer. Salary at rate of £250 per annum, with board, &c.

FREEMASONS' WAR HOSPITAL.—Resident Medical Officer. Salary as arranged.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HULL, VICTORIA HOSPITAL FOR SICK CHILDREN.—Female House Surgeon. Salary £100 per annum, with board, &c.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £200 per annum, with board, &c.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Assistant Resident Medical Officer for six months. Salary at rate of £120 per annum, with board, &c. Also Surgical Registrar. Salary at rate of 40 guineas per annum.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with board, &c.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C.—Junior House Physician. Salary £100 per annum, with board, &c.

OXFORDSHIRE COUNTY COUNCIL.—Tuberculosis Officer. Salary £500 per annum.

READING, ROYAL BERKSHIRE HOSPITAL.—House Physician for six months. Salary £250 per annum, with board, &c.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C.—House Surgeon. Salary £150 per annum, with board, &c.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Junior House Surgeon for six months. Salary at rate of £75 per annum, with board, &c.

SCOTLAND, NAVAL AUXILIARY HOSPITAL.—X Ray Operator and Anæsthetist. Salary as arranged.

YORK CITY.—Temporary Tuberculosis Officer. Salary at rate of £500 per annum.

Births, Marriages, and Deaths.

BIRTHS.

BOOTH.—On July 3rd, at Upper Richmond-road, S.W., the wife of Captain C. H. B. Booth, R.A.M.C., of a son.

HARVEY.—On July 9th, at Dorset Lodge, Merton Park, the wife of Joseph Harvey, M.B., of a son.

PERN.—On July 6th, at Botley, Hants, the wife of Alfred S. Pern, M.R.C.S., L.R.C.P., of a son.

WRIGHT.—On July 4th, at Aldborough House, Thaxted, Essex, the wife of Thomas Strethill Wright, M.B., temporary Captain, R.A.M.C., of a son.

MARRIAGES.

BRADBURN—RUBERY.—On July 6th, at St. Michael's Church, Rushall, Surgeon Thomas Stratford Bradburn, R.N., to Mary Emmeline, eldest daughter of John Tanner Rubery, J.P., and of Mrs. Rubery, The Limes, Mellish-road, Walsall.

DEVANE—KEOGH.—On June 28th, at the Pro-Cathedral, Dublin, by the Rev. R. S. Devane, John Francis Devane, M.D., F.R.C.S., D.P.H., of Limerick, to Vera, daughter of Mr. and Mrs. Andrew J. Keogh, 6, Rutland-square, Dublin.

DEATHS.

TICEHURST.—On July 7th, at Huntbourne, Tenterden, Kent, Augustus Rowland Ticehurst, M.R.C.S., L.S.A., aged 70 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ARNOLD, EDWARD, London.
Diagnosis of Nervous Diseases. By Purves Stewart, C.B., M.D.Edin., F.R.C.P. Fourth edition. Price 15s. net.

BALE, JOHN, SONS, AND DANIELSSON, London.
Child Welfare Annual. Edited by T. N. Kelynack. Price 7s. 6d. net.
Maintenance of Health in the Tropics. By W. J. Simpson, C.M.G., M.D., F.R.C.P. Second edition. Price 3s. 6d. net.

CLARENDON PRESS, Oxford, London, Edinburgh, Glasgow, New York, Toronto, Melbourne, and Bombay; and MILFORD, HUMPHREY, London, at the Oxford University Press.
Epidemics Resulting from Wars. (Published under the Auspices of the Carnegie Endowment for International Peace: Division of Economics and History.) By Dr. Friedrich Prinzing. Edited by Harald Westergaard, Professor of Political Science in the University of Copenhagen. Price 7s. 6d. net.

MACMILLAN AND CO., London and New York.
A Laboratory Course in Serum Study. By Hans Zinsser, M.D., J. G. Hopkins, M.D., and Reuben Ottenberg, M.D. Price 5s. 6d. net.

SAMPSON LOW, MARSTON, AND CO., London.
European and other Race Origins. By Herbert Bruce Hannay, of the Inner Temple, Barrister-at-Law, Advocate of the High Court of Judicature, Calcutta. Price 21s. net.

SAUNDERS, W. B., COMPANY, London.
Post-mortem Examinations. By W. S. Wadsworth, M.D., Coroner's Physician of Philadelphia. Price 25s. net.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 12th, 1916.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
July 6	29·980	W.	0·34	92	65	55	56	61	Fine
,, 7	29·540	S.W.	0·27	120	68	58	58	58	Raining
,, 8	29·584	W.	...	121	70	57	57	60	Cloudy
,, 9	29·770	S.W.	...	119	70	52	57	62	Cloudy
,, 10	29·320	S.W.	0·05	116	65	56	54	57	Overcast
,, 11	30·046	W.	...	107	67	57	54	59	Cloudy
,, 12	30·026	S.W.	...	121	66	57	56	61	Fine

Notes, Short Comments, and Answers to Correspondents.

THE UNIFORM SYSTEM OF HOSPITAL ACCOUNTS

A UNIFORM system of keeping accounts has long been adopted by the principal British hospitals, and by, amongst others, the Governments of Victoria, Queensland, and New Zealand, with several Crown Colonies. It is also in force at the principal hospitals in New South Wales, South Australia, Western Australia, Tasmania, and South Africa. The system has not yet been adopted in the Dominion of Canada, possibly on account of the difference of currency. By the use of the system expenditure at the various hospitals can be compared quite irrespective of their size, for by a slight modification of some of the books used a cottage hospital of 50 beds or less can adopt the same bookkeeping method as a large hospital.

A new edition of Sir Henry Burdett's book[1] has appeared at an opportune time, as new hospitals are being established all over the land. It is of interest to note that the "Uniform System of Accounts" originated at the Queen's Hospital, Birmingham, in 1869 and was devised by the author, with the coöperation of the late Mr. William Laundy, a well-known Birmingham accountant. Six years later the system was introduced into the Seamen's Hospital at Greenwich, and was soon after adopted by a few of the larger hospitals. The Metropolitan Hospital Sunday Fund then prescribed its use by the hospitals applying for grants, and a revised form was recommended by the Saturday Fund and King Edward VII.'s Hospital Fund. These three great hospital Funds now propose that the accounts of all institutions applying for grants from either of the three Funds should be audited and certified as correct by a chartered or incorporated accountant, who should be asked to satisfy himself that all the accounts are prepared and stated in accordance with the revised "Uniform System." Quite recently the Army Council has issued instructions that all hospitals run by the British Red Cross Society or by the Order of St. John should have their accounts kept on the "Uniform System." Sir Henry Burdett's book has therefore become a semi-official publication.

WEIHAIWEI HEALTH REPORT.

REPORTING on the affairs of Weihaiwei, the naval and military station in the province of Shantung leased to Great Britain by China in 1898, Sir J. H. Stewart Lockhart, K.C.M.G., the British Commissioner, states that during 1915 the health of the territory was very satisfactory. There were no cases of infectious disease reported except one case of paratyphoid, from which a visitor suffered, and one case of measles. One case of leprosy occurred, which was received by Dr. Fowler into his leper house at Hsiao Kan. The administration expresses its indebtedness to him for having received this patient and to Dr. Wassel, of the American Church Mission, who happened to be paying a visit to Weihaiwei, for having kindly escorted the patient to the Leper Home. In the hospital at Port Edward 7848 out-patients and 266 in-patients were treated, making a total of 8074, as compared with 6770 in 1914 and 2407 in 1907. The number of operations performed was 356, as against 335 in 1914 and 15 in 1907. In the hospital at Wênch'uant'ang 3825 new patients were seen, as compared with 3923 in 1914. 48 cases were treated as in-patients and 24 cases were attended at their own homes. In November the new hospital on the Island was opened, and is a great improvement on the former building. During the year 4530 vaccinations were performed. The number of persons licensed to smoke opium on medical grounds was 38 (as compared with 27 in 1914), their average age being 62·5 years. The number of convictions under the Ordinance prohibiting the smoking and importation of opium was 59. The highest temperature recorded at Port Edward during 1915 was 99° in July, and the lowest 7° in January; rain or snow fell on 65 days, the total fall for the year being 17·66 inches. At Wênch'uant'ang, situated about 13 miles from Port Edward, the highest temperature was 96° in July, and the lowest 16° in January and February; rain or snow fell on 84 days, the total fall for the year being 20·29 inches.

[1] The Uniform System of Accounts for Hospitals and Public Institutions, Orphanages, Missionary Societies, Homes, Coöperations, and all Classes of Institutions, with Special Forms of Account, Complete Sets of Books, Certain Suggested Checks upon Expenditure, Forms of Tender, and other Aids to Economy, Together with an Index of Classification (whereby every item of expenditure may be dealt with under identical heads by every group of institutions). By Sir Henry Burdett, K.C.B., K.C.V.O. Fourth edition, latest, and up to date. London: The Scientific Press, Limited. 1916. Pp. 128. Price 5s. net.

PUERPERAL FEVER IN THE SUDAN.

THE report upon the research work of the Wellcome Tropical Research Laboratories at Khartoum during 1915, which is not published in full on account of war economy, contains a summary (*Tropical Diseases Bulletin*, vol. vii., No. 6) of an investigation by the director, Dr. A. J. Chalmers and Dr. Alex. Marshall into the bacteriology of puerperal fever. They found this to be in the Anglo-Egyptian Sudan mostly a local uterine infection and not commonly a septicæmia. Two causal organisms were *S. salivarius* and *S. bovis* (= *S. bovinus*, Broadhurst, 1915). The writers also found cases in which the causal organism was *S. versatilis*, Broadhurst, 1915, a member of the *fæcalis* group, and another due to *S. fæcalis*, Andrewes and Horder, 1906. The sources of infection appeared to be principally from human, equine, and bovine fæces, the two latter being largely used in Khartoum and Omdurman as an application called "Zibla" which is applied to roofs and walls. Cow dung is also used as a poultice by the natives.

Messrs. C. and J.—Sterile catgut is manufactured in Edinburgh by Messrs. G. F. Marson and Co., 7, Meuse-lane, South St. Andrew-street.

Messrs. B.—The apparatus for chloroform anæsthesia in military practice described by Professor A. D. Waller in THE LANCET of May 13th is made by Messrs. Coxeter and Son, of 171, Pancras-road, N.W.

The following magazines, journals, &c., have been received:—Science Progress, Dublin Journal of Medical Science, Tropical Diseases Bulletin, Calcutta Medical Journal, St. Bartholomew's Hospital Journal, Edinburgh Medical Journal, Birmingham Medical Review, Medical Review, Review of Neurology and Psychiatry, Archives of Radiology and Electrotherapy, American Journal of Public Health, Journal of State Medicine, Cleveland Medical Journal, British Journal of Tuberculosis.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, July 20th.

DERMATOLOGY (Hon. Secretaries—A. M. H. Gray, J. E. R. McDonagh): at 5 P.M.

Cases:

Dr. G. Pernet: (1) An Extensive Case of Lupus Vulgaris of Leg following a Tuberculous Abscess; (2) Dermatitis Herpetiformis in a Boy; (3) Multiple Lupus Vulgaris with Unusual Features in a Girl.

Friday, July 21st.

SURGERY (Hon. Secretaries—Raymond Johnson, V. Warren Low): Special Meeting at 5 P.M.

Paper:

Major Tait McKenzie, R.A.M.C.: The Treatment of Convalescent Soldiers by Physical Means (illustrated by lantern slides of cases under treatment).

Members of other Sections are cordially invited, and the paper will have special interest for Members of the Sections of Balneology, Electro-therapeutics, and Neurology.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

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January to June, 1916.

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